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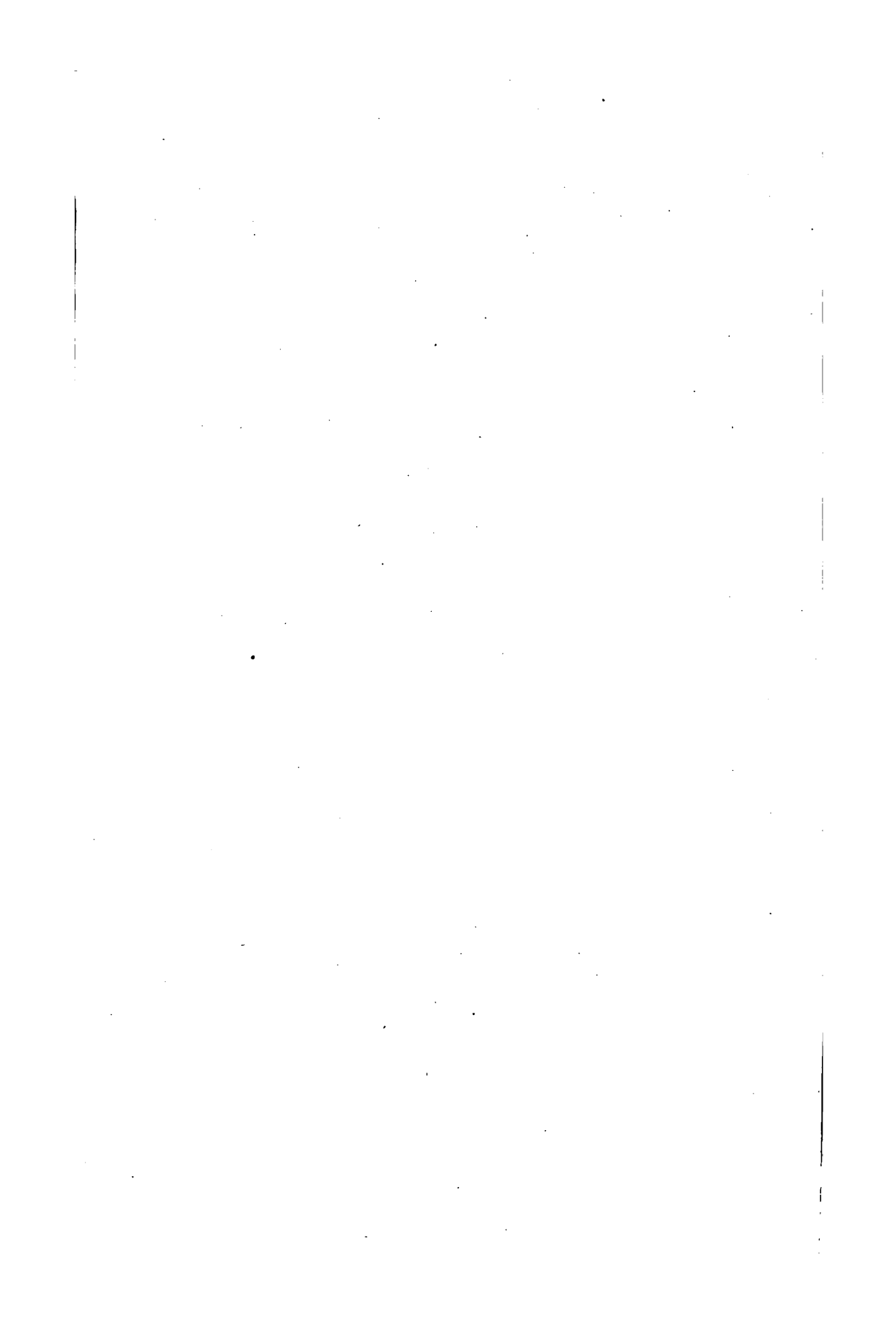


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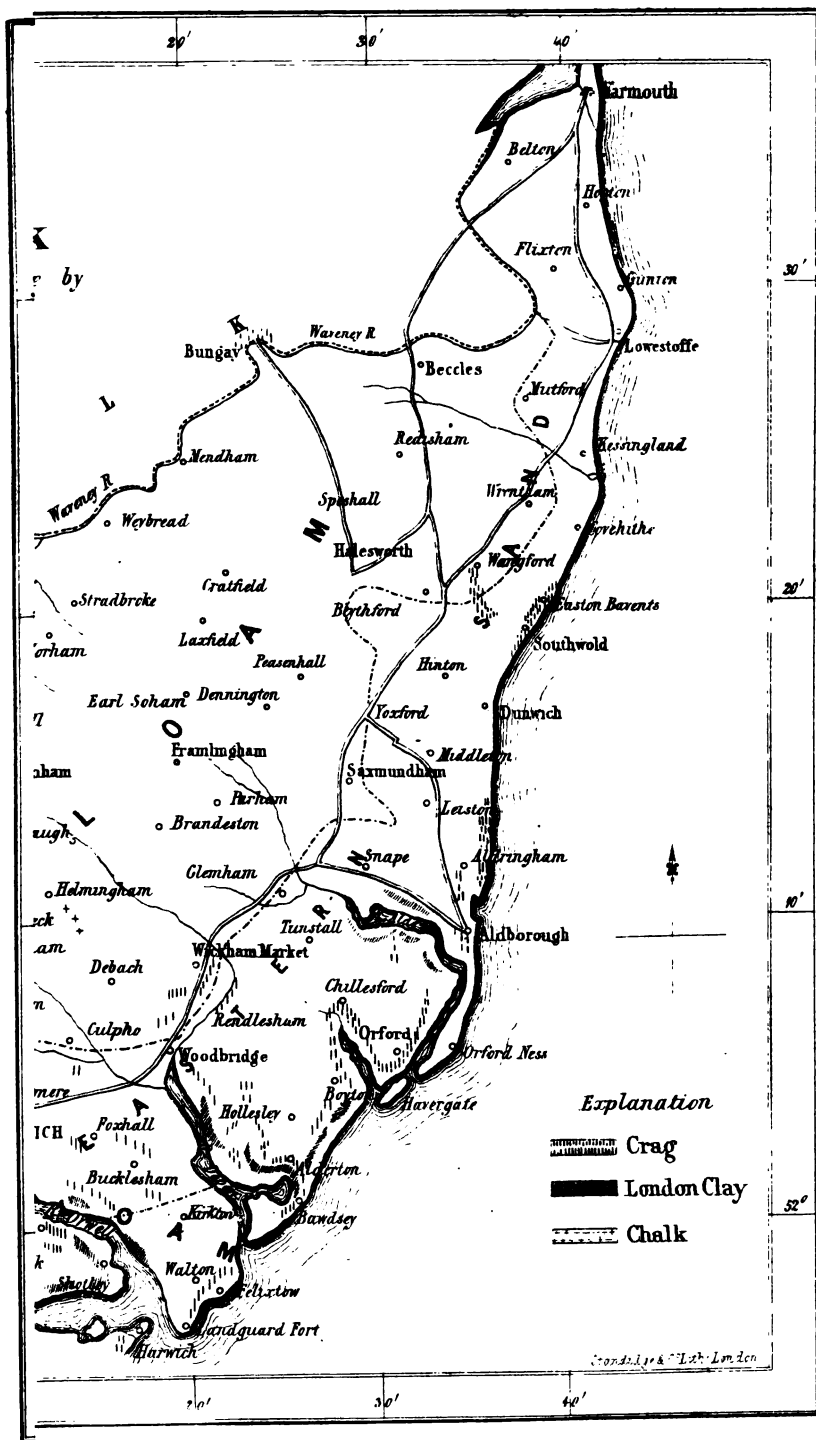












ON  
**THE AGRICULTURE OF SUFFOLK:**

BY WILLIAM AND HUGH RAYNBIRD.

INCLUDING  
**THE REPORT**

TO WHICH THE PRIZE WAS AWARDED BY THE

**Royal Agricultural Society of England.**



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And other Gentlemen, whose Names are omitted by their own desire.

## INTRODUCTORY PREFACE.

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It has been well remarked by Arthur Young, in the introduction to his Suffolk Report, that "it is not easy to conceive an undertaking more difficult, than to give such an account of a province as shall, on one hand, be minute enough to convey satisfactory information, and, on the other, shall not be so minute as to include matter either of insufficient importance, or that is more calculated for a general treatise or Report than for a local or appropriated one." This opinion of one so experienced and talented as Young, may serve in some measure to excuse the omissions and defects of the following work. And the mode of its publication, viz., that of combining subjects under various heads, and the opinions of numerous correspondents, with an Essay already printed, tended to make this book still more desultory in its nature than it otherwise would have been, and has unavoidably given rise to some repetitions, although such were avoided as much as possible. The Alphabetical Index at the end will, however, enable any one to find all that is stated on each particular subject.

Notwithstanding the length of the work, I am aware many omissions will be found in it; but such must be the case to some degree, unless it were extended to an encyclopædial character and size.

What Arthur Young says on this head is much to the point. "The proper idea of a Local Report is to describe the most interesting features of the local practices, and the most remarkable deficiencies; the one as an example to other counties, the other for attaining the knowledge that might prove useful to this, with such Statistical Returns as might enable one to judge of the real state of the county: any chapter, section, dissertation, &c., that might be taken from one county, and with equal propriety inserted in another, is not properly part of the Return of a particular district. If such a distinction be not adhered to, the Report



of a single county might swell into a complete body of husbandry."

It will be seen that, up to p. 70, this work consists of the Royal Agricultural Society's Prize Report on the Farming of Suffolk, and the principal subjects in this portion, which hardly comprises one-fourth of the present volume, are—

1. The Character of the Soils of the County.
2. The Management of the Land on the various soils.
3. The Improvements effected in the Farming of Suffolk since the Report of Arthur Young, in the year 1804.
4. The Antiquity and Extent of Thorough-draining within the County.
5. The Process of Marling, and the soils benefited thereby.
6. The Process of Burning Clay, and the soils to which it is applicable.
7. The Improvements still required in the County generally, as to the higher culture of existing Farms, the Reclamation of Waste Lands; and the Condition of the Agricultural Labourer.

As these were the subjects appointed by the Royal Agricultural Society, no remarks need be made on them.

The additions to this volume consist of—

1. Observations on the Former state of Agriculture in the County, principally compiled from various publications of the different periods.
2. Observations on the Present state of Agriculture in the County. This consists chiefly of Remarks of Correspondents on the present state of Farming; on Leases; and on the Farming Statistics of their districts.
3. Memoir of the late Arthur Young, Esq., and Notices of other celebrated Agriculturists of the County.
4. An Illustrated Description of the Agricultural Machines invented or manufactured in the County.
5. The Agricultural Societies and Farmers' Clubs, with specimens of the Discussions at the latter.

6. On the Agricultural Labourer. His manner of life, &c. ; with the Local Words and Customs of that class, so far as they have any connexion with Farming.

This last subject, "Local Words and Customs," as it has never yet, I think, appeared in a County Report, may be thought unsuitable ; but I think it was required, to enable many expressions used in the work, to be understood by those not living in the county ; and perhaps this portion of the book may also render it more interesting to those *not* agriculturists.

In conclusion, whatever merit this work may possess, is owing to those gentlemen who, either verbally or by letter, so kindly and readily afforded the information. To all of them collectively I beg to return my sincere thanks, and but for the fact that many are already mentioned by name in this volume, and that many more have, as I am well aware, an objection to their names being brought before the public, I would here have given the names of the persons to whose aid I am indebted. My thanks are also due to those gentlemen who encouraged my undertaking by their subscriptions.

To the Agriculturists of Suffolk, taken as a *body*, my work can afford nothing new, although I hope that, whatever be its imperfections, it may be useful in some degree to *individuals*, as causing the practice and experience of many separate persons to become more generally known.

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## ERRATA.

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- Page 1, line 8 from bottom, *for* "250,000," *read* "260,000."
- 49, — 5 from bottom, *for* "Flowerden," *read* "Flowerdew."
  - 50, — 23, *for* "London," *read* "Loudon's."
  - 58, — 20, *for* "Cluttern," *read* "Clutton."
  - 199, the position of the engraving of the "Plough-ground and Share" ought to be reversed.
  - 207, line 12, *dele* the words "(see fig.)," which refer to the subsoil, not the subsoil plough.
  - 242, — 12, *insert* "some of" between the words "are" and "the;" and after line 22, *insert* "and others by Smyth of Peasenhall, and Ransome of Ipswich."

## ON THE FARMING OF SUFFOLK.

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### PRIZE REPORT.

IN offering this report on the farming of Suffolk, I would first observe that there are various causes which render it difficult to communicate much that has not already come before the agricultural world, though at the same time it makes the task of writing a Report easier. 1st. The voluminous writings of Arthur Young refer in a great measure to the county in which he resided. 2nd. All the neighbouring counties, Norfolk, Essex, and Cambridge, have already been described in the Society's Journal. The cultivation of our heavy land resembles that of the adjoining parts of these counties, of our western light land that of the light land of Norfolk, and of our fens that of the fens of Cambridgeshire. Norfolk and Suffolk may be considered nearly as one county, as they are generally named together; and indeed Mr. Bacon, in his report of Norfolk, has forestalled much that relates to Suffolk in his able account of the celebrated Suffolk machine-makers, Ransome, Garrett, and Smyth. 3rd. Many of our countrymen have already described several of the Suffolk practices in the Society's Journal, as Sir Henry Bunbury, on Cottage Allotments; Hill, Essays on Cottages and on Draining; Rodwell, on Mowing Wheat and Italian Ryegrass; Raynbird, on Measure Work and the Cultivation of Beet; Burroughes, White Mustard; Dobedo, Fattening Cattle; Peirson, on Burning Soil; and Poppy, in various publications on Mangold Wurzel, Burning Clay, &c. These gentlemen have so recently written on the subjects here named, that it would be but a repetition to enter very minutely into them, except where they have omitted giving a full description.

*Extent.*—Suffolk presents a level and well-watered surface of a crescent-like form. Its length from E. to W. about 48 miles, and breadth from N. to S. nearly 30 miles. Its extent is reckoned at 918,760 acres.

It is estimated that there are about 46,000 acres of rich loam, 80,000 acres of marsh and fen land, 450,000 acres of a heavy loam or clay, 250,000 of sand of various qualities.

The climate is one of the driest in the kingdom, hence the fine quality of grain grown; but the turnip crop frequently becomes mildewed when early sown, from a continuance of dry weather. We have many county meteorologists, from whose observations we may both tell the past seasons, what kind of weather we are to expect in general, and compare the climate as to drought, rain, frost, &c., with other parts of England.

### 1. *The character of the Soils of the County.*

In describing the soils of Suffolk, I have followed the example of Arthur Young in giving a map of the soils, believing that this will give a better idea of the distribution of the several varieties of land than any other method. Though this plan will only be an approximation to the truth, as variations are to be found in every part, yet the surface soil of Suffolk is perhaps as clearly defined as that of any other county possessing an equal extent of land with the same distinct variations in the soil.

If a correct geological map, showing the substrata of the county, had been added to this Report, it would have been more satisfactory to the scientific agriculturist; but as a great part of Suffolk is covered by shallow deposits of sand, gravel, clay, and loam, a geological map would not have exhibited the agricultural relations of the county more faithfully than the annexed sketch of the surface soil. The latter will, at least, give an idea as to the kind of farming a stranger may expect to see in any particular locality. And the chalk and crag pits being marked, will be a slight index to the subsoil.

It will be seen on the map that there are 5 distinct divisions, each of which demands a description.

1. Strong loam. Woodlands.
2. Eastern sand. Sandlings.
3. Western sand. Fieldings.
4. Rich loam.
5. Fen.

S. Woodward, Esq., has favoured me with the following information on the geological character of the soil:—

“The lowest stratum in the county is chalk, which exists at a greater or less depth beneath every part of it, except the small corner occupied by the fens, which rest either on green sand or Kimmeridge clay. Proceeding westward from Bury along the road to Newmarket, the chalk either appears on the surface, or is covered with a very moderate thickness of sand, and throughout the whole of the western sand district, the chalk is at no very great depth from the surface. The old warrens used to indicate the locality of beds of sand. Even at Botesdale, east of Bury, there are chalk pits. Further east the chalk inclines rapidly, and is lost sight of beneath several hundred feet of clay, sand, and gravel, except in some places, for instance N. of Ipswich, where the turnpike-road cuts through it; and there are chalk-pits at Debenham and Stowmarket. In the neighbourhood of the valleys of E. Suffolk the chalk is probably never far from the surface, as these are valleys of elevation. The London clay makes its last appearance northwards in East Suffolk; the base of the sea cliff at Felixstow consists of a dark clay, containing the characteristic fossils of the London clay; it extends inwards as far as Hadleigh, but is buried beneath newer clays and gra-

vels. The next stratum above the London clay, the Crag, is also limited in extent. It is a ferruginous sand, full of shells, and was once much used as a dressing for clay lands. At Walton on the Naze it is about two yards thick, and abounds with spiral univalves, sharks' teeth, &c. At Harwich it is scarcely discoverable, and at Felixstow it is reduced to a shingle bed, consisting chiefly of nodules containing 56 per cent. of phosphate of lime. Mr. Lawes had several tons of this ground up for manure. At Aldborough and Orford the crag becomes coralline, and is often a complete coral reef. At Woodbridge there is the red crag, with the same shells as at Walton; and near Southwold, the newest beds of crag containing teeth of the mastodon and elephant, and shells of mollusks still living on our coast. Between Southwold and Yarmouth the cliff consists of sand and gravel, with a bed of clay 'till,' sometimes forming their base, and again rising up to the middle or to the surface. The 'till' is seldom a clay impervious to water, it usually contains a great quantity of chalk; in other parts it consists entirely of the wreck of the Kimmeridge clay, oolites, &c., which once filled up the present 'level of the fens' with a thousand feet of strata."

*Heavy Land or Strong Loam.*—It will be seen by the map that this district takes in the great body of the county, extending from the S. to the N. extremity, and from the S.W. nearly to the N.E. corner; this throughout its whole extent consists chiefly of a clayey loam on a clayey or marly subsoil, in some places the soil takes more the character of clay, in others that of a loam. The variations from this are but slight. On referring to the map, it will be seen that chalk pits are dotted in various places—wherever they occur, the soil in their immediate vicinity of course partakes of a chalky character in a greater or less degree. About Weybread and Mendham the soil in some places is of a sandy nature. Along the course of the Waveney are rich grazing marshes composed of alluvial soil. The low hills that border the Waveney have frequently stiff clay on their summits, and light sandy land in the bottoms. Throughout the "heavy lands," as this is locally termed in contradistinction to the "light lands," or sandy districts, the soil bordering on the rivers is the richest, the most easily cultivated, and therefore the best land for the farmer, and to be preferred to the retentive soil that generally occurs.

*Eastern Sands.*—The tract of land on the eastern side of the county, bordering on the sea-coast, is more or less of a sandy nature, a great portion of which is highly cultivated, though in some parts the soil is of a very inferior description, sometimes a blowing sand, and still lying almost waste. A large extent of wild heath land is to be seen in travelling from Wickham Market to Orford; the road passes over Tunstall heath, which has every appearance of barrenness. And again, the country between Orford and Woodbridge, and a large portion of Wilford Hundred, the crops during my ride through that part in the summer gave

ample evidence of a sterility which the existence of so extensive a tract of waste land as Boyton, Iken, Chillesford, Sutton, and Hollesley Heaths sufficiently corroborated. The heath land from Sutton to the bridge over the Deben,\* near Woodbridge, appears, from the luxuriant growth of the ferns and whins, to be of a better quality.

There is so great a difference in the quality of the land in the eastern sand district, that I have the authority of a gentleman, who is one of the largest tenant-farmers in Suffolk, in stating that land may be found on nearly every farm, the value of which to rent will vary from 5s. to 28s. per acre. In some parts of this district the sand lies to a considerable depth; and when this is the case it precludes any improvement by the admixture of soils, unless at a very great cost. In other parts the subsoil is chalk, marl, or crag, and here the great means of the improvement of the texture of the sandy soils is to be found. The admixture of the subsoil with the surface has more than anything else contributed to place the cultivation of the light lands of Norfolk and Suffolk in the first rank in the scale of farming.

On the whole line of sea-coast there are tracts of salt marshes, varying in value from 5s. to 25s. per acre, as they are more or less subject to the influence of the tides. A great portion of the marsh land is subject to inundation when the tides happen to be unusually high. This may not occur for several years; but when it does, it is productive of great injury to the marshes for many years.

*Western Sand District.*—This tract of country takes in some of the worst description of soil, much of it being a blowing sand on a subsoil of chalk or chalky clay (in some places† the chalk appears at the surface) and is never at a great depth. In the report of Arthur Young, it is mentioned as abounding in rabbit-warrens and sheep-walks; a great proportion of these have been broken up, and the district is altogether much improved, though some of the land is so sterile, as to almost defy all attempts to bring it into a productive state. The worst description of soil occurs at Thetford, Brandon, Wangford, Lakenheath, Icklingham, Cavenham, and West Stow. The S.E. portion of this division, in the neighbourhood of Bury, is of rather a better staple, the soil being a gravelly loam, and in some places the characters of heavy and light land become intermingled.

*Rich Loam.*—This comprehends the greater part of Colneis and Samford Hundreds, the lands of which may be considered the best in the county; and it cannot be better described than in

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\* Wilford Bridge.

† The chalk appears at the surface at Barnham, Thetford, Brandon, Eriswell, Newmarket, and to a less extent at many other places.

the words of Arthur Young :—" From the River Deben crossing the Orwell, in a line some miles broad to the north of the River Stour, to Stratford and Higham, there is a vein of friable putrid vegetable mould, more inclined to sand than to clay, which is of extraordinary fertility; the best is at Walton, Trimley, and Felixstow, where, for depth and richness, much of it can scarcely be exceeded by other soil to be found in others parts of the county, and would rank high among the best in England."

The last district, occupying the extreme N.W. corner, is composed of fen land, the peat overlaying the clay, though on the borders of the fens the subsoil is often sand. A narrow strip of peaty soil extends along the banks of the River Ouse, and also along those of the Lark; this is chiefly meadow land, generally producing a very inferior description of grass.

This small tract of peat land has perhaps undergone as much improvement as any other part of the county. Arthur Young mentions the fens as being partly under water; they are now well drained by powerful steam-engines. By the application of bones, and by the process of claying, very abundant crops are produced, though the quality of the grain is not equal to that of the adjoining light land. In the time of Arthur Young the staple produce was oats and coleseed; but the application of clay has completely changed the nature of the soil, and on the best cultivated farms a four-course system is adopted of—1st year, fallow for coleseed drilled with bones and the crop fed off by sheep; 2nd, oats and sometimes barley; 3rd, layer or beans; 4th, wheat. Fen-wheat is considered a good change of seed for light land. Timothy grass (*Phleum pratense*) has of late years been grown on the fen farms, and is considered an acquisition; it is either sown by itself and allowed to lay down three or four years, or it is sown with clover; for the latter purpose it must be well suited to this kind of soil.

One cause of the improvement of the fens is that many of the large light-land farmers are also holders of fen farms, and, being men of education and capital, have raised the cultivation of the soil.

## *2.—The Management of the Land on the Various Soils.*

In describing the farming practices of the different soils I shall divide the county into two divisions—the heavy land, including the greater portion of the county; and the light land, which may be subdivided into the eastern maritime sandy districts or sandlings, and the north-west sandy districts or fieldings. The fen district occupying the north-west corner of the county is of so small an extent, and the similar soil of Cambridgeshire has been so lately described by Mr. Jonas, besides being a subject



for an essay for the ensuing year, that it can hardly demand much attention in this Report. The farms in the heavy land district seldom exceed 300 acres in extent; they are generally much smaller, and many are found from 30 to 50 acres. There are some large farmers (*i.e.* those holding several farms) but few large farms, the land being subdivided, and many small landowners farming their own estates. The farms on the light land are much larger, and vary from 300 to 1500 acres.

Most writers on the farming of Suffolk have found fault with four practices:—

1. Bad management of grass-land, and bad system of making hay.
2. Want of irrigation, notwithstanding the number of streams suitable for the purpose.
3. Heavy carts and waggon.
4. Inconvenient farm-buildings and large barns; and a stranger travelling through the county would add a 5th, in the number of hedges and *hedge-row trees*.

These are, however, no new complaints; for Arthur Young condemns them all. However, the 1st and 2nd objection is in process of removal by the pasture-land being at the present time in the course of conversion into arable land. The 4th and 5th are faults for which the owners of the soil are rather to be blamed than the occupiers and cultivators; but, though improvement has been slow in these, yet it has made ample strides in those practices, which at the time Arthur Young wrote his report were deemed much nearer perfection. Among the practices most worthy of notice are—

1. The system of *thorough draining*, which there is ample evidence to prove has been practised for more than a century.
2. The system of *tillage*,—ploughing, harrowing, rolling, drilling, horse-hoeing, &c., adopted on heavy land, by which the injurious effects of treading is *avoided altogether* in these operations.
3. The universal system of ploughing with *two horses*, however stiff the soil may be; and, as the Suffolk poet says,

“No wheels support the diving pointed share,  
No groaning ox is doom'd to labour there,  
No *helpmates* teach the docile steed his road,  
Alike unknown the *plough-boy* and his goad;  
But, unassisted through each toilsome day,  
With smiling brow the ploughman cleaves his way.”

BLOOMFIELD'S *Farmer's Boy*, 1798.

4. The practice of sowing spring crops on a *stale furrow*, the action of the elements during the winter being found more effectual in securing a fine tilth than spring cultivation.

5. The cultivation of *mangel wurzel*.
6. The *admixture* of the *subsoil* with the *surface*, by claying and marling light land.
7. The cultivation of roots, particularly *carrots*, on light land.
8. The *manufacture* and *use* of agricultural implements.
9. The breed of *farm-horses*.

Having thus enumerated the most striking features in the farming of the county, I shall proceed to give a description in detail of the

*Management of the Heavy Land.*

I shall first treat of the heavy land district, which is the most extensive, as will be seen by reference to the map; and from its extent, and the general superior quality of the land, it is also the most important. Draining and the peculiar system of drill husbandry have rendered it one of the finest corn districts in England; the increased cultivation of green and root crops, especially mangold-wurzel, is rapidly contributing to place the farmers among the largest graziers of fat sheep and cattle. A great portion (the middle and northern part) was in the time of Arthur Young the seat of the celebrated Suffolk dairies, these have nearly disappeared: it is said that there is not a tenth part of the number of cows now kept. At that time the dairy farms consisted of grass land; they are now chiefly arable, and what pasture remains is rapidly being broken up wherever permission is given to do so.

The low price of butter and cheese, caused by the competition with Ireland and Holland, and a reason which I have heard advanced by more than one farmer, viz. the difficulty of procuring dairy servants, have mainly contributed to the disuse of the dairy system. But when we consider it is now asserted by many who were themselves dairy farmers that one-third more is paid for rent, two-thirds more for tithes, and double the amount for labour than was paid under the dairy management of the latter part of the eighteenth century, it shows at once that the improvement in the farming has been very great, particularly as this is a thickly inhabited agricultural district, where nearly the entire labouring population has to depend on the farmer for its subsistence.

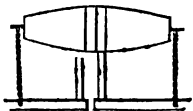
Hemp was grown in the time of Arthur Young to some extent in that part of the county between Eye and Beccles, but its cultivation is very nearly discontinued.

The present system of drilling was in its infancy when Arthur Young wrote his report; it is now become general, and on the soil adjoining (the light land district) it is probably carried too far, for here light sandy land is sometimes seen ploughed in narrow stretches, with deep furrows between them; this must occasion a loss as nothing grows in the furrows, and also cause injury by the deep furrows drawing the water from the soil.

The land of this district being ploughed with great exactness in 10 or 12 furrow stetches ( $7\frac{1}{2}$  feet and 9 feet), the drills are constructed to sow either a whole or half a stetch at once, leaving for wheat about 1 foot in the furrows unsown. A whole drill (one that covers a stetch) is drawn by four horses (two in each furrow) for wheat sowing, and three for drilling spring corn, though six horses are used in the very large drills that cover a 12-furrow stetch. Half drills, for sowing half a stetch at once, are the most generally used for 12-furrow work; in these the shafts are quartered, so that the horses (usually two) walk in the furrow followed by one wheel, the other wheel working upon the top of the stetch; but in wet weather the path made by this wheel is considered to be injurious, particularly if the wheel runs upon a row of seed that has already been deposited: but to prevent this, the half drills are fitted with a slip axle which admits of being lengthened out that the wheels can be adjusted to go in the other furrow, and thus do the work without any injury either from the treading of the horses or the tracks of the wheels on the land.

The other implements, such as harrows, rolls, horse-hoes (where used), are also constructed so as exactly to fit the stetches, and the horses walk in the furrows. Horse-hoes, which are used in some parts, though not in all, are fitted with adjusting axles similar to the drills. The old common horse-hoe is used by some farmers for horse-hoeing wheat, barley, beans, and roots; and with such exactness is it managed that 6 and 7-inch rows are often hoed without injury to the crop.

Barley and other light rollers are made double, and cover two half-stetches, the horse walking in the furrow; a small roller or "follower," as it is termed, for rolling the furrow, is attached to the hinder part of the rolls by chains or by a frame of wood thus.



The shafts of the double roll admit of being altered, so that one roller may be used by itself; or, when removed from one field to another, one roller can be conveniently placed before the other. Heavy rollers have the shafts quartered or placed on one side.

Having thus described some of the principal features of this district, I shall proceed to consider the rotation and manner of cultivation pursued. In the course of cropping there is much variation, particularly among the smaller farmers; but on the largest estates and throughout all the best cultivated farms the course of cropping is:—

1. Fallow : either clean fallow, tares, beet, or turnips.
2. Barley.
3. Half clover ; half beans or peas ; alternately.
4. Wheat.

This may be taken as the general course. The modifications which are occasionally made by good farmers are:—In the first year having all long fallow on strong land, or all roots, or growing rye-grass or trefoil for spring feed, and then breaking up for fallow. In the second year the growing wheat after beet, and sometimes after turnips, instead of barley. In the third year, the growing tares instead of beans, and, what has lately been introduced, the cultivation of Italian rye-grass instead of clover, by which the repetition of the latter is removed from eight to twelve years. And the growing of oats on freshly broken-up land, and, to a small extent, in lieu of other white-straw crops for the purpose of home consumption.

Variations, the usefulness of which is much to be questioned, are the taking a third crop, as it is called, which is oats after wheat and then fallow; the growing white-straw crops in succession on freshly broken-up pasture: many instances are known of farmers ploughing up a piece of sward, taking first colesseed, and then wheat for three years running. Such scourging as this is much to be reprobated, and is productive of considerable injury to the land, the farmer, and the nation at large; such deviations as growing two white-straw crops in succession ought never to be sanctioned, though deviations from any rotation, however good, may frequently be made with propriety by the judicious cultivator to suit circumstances. The constant recurrence of one monotonous round of cropping must after a time end in the failure, to a certain extent, of one or more of the plants grown; and the farmer being bound to this, is unable to exercise his judgment in growing those crops which will command the highest price in the market.

The four-course rotation, as adopted on the heavy land of Suffolk, is perhaps better suited to this description of land than most others; it is certainly better than any other that has yet been tried.

The recurrence on the average of a long fallow once in eight years is considered absolutely necessary by the best farmers for the cleaning and amelioration of stiff land by repeated ploughings and pulverizations; and there are a few who consider a clean fallow is necessary every four years. The failure of the clover is generally prevented by its recurrence only once in eight years. The growing of peas and beans to be followed by wheat may be objected to by some who farm in a distant part of the country, but without much cause; the deep hoeings and clean cultivation of the pulse makes it a good preparation for wheat—as an instance of which, one farmer has grown wheat and beans alternately for twenty years without any perceptible deterioration of the annual crop, in a part of the county where the four-

course system is usually practised—while the system of beans and wheat alternately, with a fallow every five years, is adopted in a small extent of the county where the soil rests on the London clay.

*1st Year, Fallow.*—The number of ploughings to make a clean fallow is 5, sometimes 6, viz. :—1, ploughing in the stubble; 2, turning back the furrows; 3 and 4, ploughed overthwart (across the previous ploughings) in broad stetches usually 2 rods wide, 5 stetched up for turnips, or if long fallow, for barley; some give the stetches another ploughing before laying the land up for the winter.

The first ploughing of a clean fallow is given generally previous to the winter setting in, though there are some who advocate the practice that was common thirty or forty years ago, of allowing the land intended for long fallow to lie unploughed till the spring, alleging that the land works much better. This is entirely out of the question for roots, but there are feasible reasons to give for its being adopted, it allows more time for the preparation of the other fields intended for roots; and it does not spoil the early partridge shooting, as there is no occasion for the immediate removal of the stubble—the latter is not of much importance to the tenant, though it certainly is to a few of the owners of heavy land. Much, however, depends on the season; wet land ploughed up, and then exposed to an open and rainy winter, will most likely work badly in the spring, and probably much worse than if allowed to remain whole. The advocates of breaking up fallows in the spring will certainly allow that there is advantage in exposing land to the frost, for the same farmers who objected to the autumn ploughings of long fallows yet advocated the autumn and winter preparation for roots.

Harrowings and rollings intervene between the ploughings, though it is considered by some farmers that too many harrowings are frequently given: the couch-grass and rubbish is got out of the land after the second ploughing, it is brought to the surface by harrowing and picking, and then burnt. After the second ploughing overthwart, a marker of the exact width of the stetches is sometimes used previous to ploughing the land in stetches—this is a bar of wood or iron having two coulters at the required width fixed behind a pair of wheels and shafts, usually those of the horse-rake; this is drawn over the land, and leaves straight marks for the guidance of the ploughman. The land being laid up for the winter before Christmas, the barley is drilled upon the earth which has been pulverized by the winter frosts without any other preparation than a light harrowing or scarifying.

As a rule, no advantage is ever derived from ploughing fallows in wet weather, and very seldom from sowing the seed, whether

of turnips, beet, or barley, directly after the plough. One of the greatest difficulties attending the cultivation of roots on heavy land is the getting the land into sufficient tilth; if the land is ploughed when wet, the furrows harden into one mass, and if very dry it breaks up into clods. By spring-ploughing there is every chance of producing clods instead of mould, and hence the advantage of preparing land intended for roots in the winter or autumn. The ridge cultivation, so well adapted for the removal of roots from a heavy soil, cannot be practised with the certainty of securing a crop when the land is ploughed in the spring; on account of the difficulty of bringing the land into good tilth under the system of five ploughings, seed sown on a ridge of clods is less likely to vegetate than when sown on the flat stretch, hence the latter method has until lately been generally adopted.

When tares are grown on the fallow, manure is generally applied at the rate of from fourteen to sixteen loads per acre, the land ploughed once, and the seed drilled at the rate of from ten to twelve pecks per acre; half a bushel of oats or rye is frequently added; when sown late in the season the quantity of seed per acre is increased; the purposes to which the tares are chiefly applied are for soiling the horses during the summer. Where sheep are kept tares are sometimes fed off, either with hurdles on the land or mown and carried on a pasture; when hurdled, the tares are generally mown before given to the sheep. A few farmers sow coleseed or turnips after the tares. A heavy-land farmer who has practised the system of tare-husbandry for sheep has given it up, having found that it is impossible to keep his land clean; he allows that a good crop of tares has a cleaning effect on the land, though he considers a bad crop to have quite a contrary effect: by substituting a long fallow he is able to keep his land clean, though he does not grow a heavier barley crop.

Tares are by some given to grazing bullocks; I found one farmer was feeding on tares, beet, bean and barley meal, and cake, in June, 1846.

Italian rye-grass and trefoil have of late been grown by farmers who keep sheep for the purpose of affording spring feed; they are sown on a wheat stubble; after feeding off in the spring the land is broken up and sown with turnips or summer fallowed.

*Turnips, &c.*—The practice of reaping wheat still prevails, and consequently the stubble has to be cleared off the land previously to its being ploughed up: this is undoubtedly a loss of time, particularly on those lands intended for mangel or swedes; but the question is, how are we to obviate this? The mowing such heavy crops as are generally grown is not likely to be practised in every district, but still mowing, bagging, or reaping low will further the preparation of the land for beet and swedes, as there

is then time to plough the land before wheat-sowing; this is an advantage not to be despised, as it is one move towards securing a crop. Several methods are adopted in the cultivation of roots, each of which has its advantages; they will therefore demand a separate description. I shall first consider the old method, which is still generally adopted for white turnips, and frequently for swedes and beet. In this the fallow is made in the usual manner, but in time for the season of turnip-sowing. Muck is applied by some; by others a dressing of burnt earth, and on some land artificial manure (particularly where the crop is intended to be folded with sheep), such as rape-dust, bones, and guano; white turnips are drilled from 14 to 18 inches apart, and beet at proportionably wider intervals; the turnips are hand-hoed at a cost of from 6*s.* to 7*s.* per acre. The late period at which turnips are usually sown is the great objection to their success on heavy land, which is not suited to the feeding with sheep; for if late sown they remain on the land through the winter, and the removing them day after day at a cart-load a time in any weather must be productive of injury to the land; by early sowing, the roots may be removed from the land and stored early in the season with comparatively little injury.

The early season at which beet is sown, and the little injury it causes when carted from the soil, are the merits to which it owes its extended cultivation; there are few farmers in the heavy-land district of Suffolk of 100 acres that do not grow on an average four or five acres of this valuable root. The more the turnip-husbandry approaches that of beet in respect to the early sowing and removal from the soil, the sooner will it arrive at perfection on these heavy soils. White turnips, which are apparently cultivated to the greatest extent, should give place to beet and swedes, both are superior in their feeding qualities, as well as what gives them a *greater value*, their *property of keeping* when removed at an early season from the land and stored in a convenient situation.

*Beet.*—I shall now proceed to give a description of the cultivation of beet, which has been introduced about thirty years, during which time its cultivation has been continually on the increase; and it may be truly said that it is a crop which has tended more than any other to improve the heavy land of Suffolk, and I may with confidence assert that its cultivation is one of the greatest improvements that has been introduced since the report of A. Young in 1804. It has filled up a blank which used to occur in the feeding of sheep and cattle on heavy land, the *providing spring food*.

Land intended for beet is ploughed immediately after harvest, and the fallow made in the usual manner of ploughing the

stubble in, ploughing back, thwarting twice, but instead of the fifth ploughing or stetching up, the land is ploughed in ridges from 27 to 36 inches wide with the common plough, a dressing of from 16 to 20 chaldron-loads of farm-yard manure is applied; some use muck fresh from the yard, others compost dung; the manure is then hoed in by splitting the ridges, the land rolled, and the seed, from 5 lbs. to 6 lbs. per acre, is either dibbled by hand or drilled at the latter end of April or beginning of May.

Before hoeing, a plough without a breast and fitted with a broad share, or a shim with a share and side-hoes, is used between the drills, and good cultivators repeat this several times throughout the summer; the mangel is generally hand-hoed three times, the first hoeing costs 3*s.* 6*d.*, the plants being singled by children after the hoer; the other hoeings cost about 2*s.* 6*d.* per acre: it is found that the deeper the land is cut with the hoe, and the more the soil is pulled away from the bulbs, the less liable they are to grow with long fibres and fangs. The varieties chiefly cultivated are the long red; the red and yellow globe varieties have lately been introduced. Horn beet, a variety of the long red, is preferred by some.

Beet grown on the stetch (usually four rows on ten-furrow work) has more roots than when grown on the ridge; this is attributed to the earth not being so much pulled away by the hoe. Mangel is harvested about the latter end of October or beginning of November; the pulling and stripping the leaves is often done by women and children at so small a price as from 3*s.* 6*d.* to 4*s.* per acre; they are then carted off the land and laid on a headland, or in a convenient place in a ridge-like heap about six feet wide and four feet high; this is covered with straw or haulm, and then with a layer of earth taken from the side of the heap; the top or ridge of the heap is generally left uncovered with earth; some take the precaution of adding another layer of haulm on the outside of the mould. In May the roots begin to shoot, and are then likely to heat and rot; to prevent this the heap is broken up, the shoots rubbed off, and the roots laid in a barn or outbuilding. It is obvious that by the bulbs growing they will lose a portion of their nutriment; it is, therefore, folly to allow them to grow in the heap. Some do not pull down the heap, but merely remove the roots to the cattle as wanted, and yet find that they will keep through the summer without decaying, but the heap should not be made very large, and the roots should be dry when laid up.

If wet weather occurs at the time of pulling, different methods are practised to prevent injury to the land by carting; some pull the mangel and cover them with the leaves, and allow them to remain in that state till dry weather comes for carting off.



Another plan is to remove the roots entirely by manual labour; and I have the authority of Mr. A. Gissing, of Stradbroke, to state that in a wet season he got his beet off a ten-acre field without the aid of horses, at a cost of 9s. per acre; women and children pulled the beet, while men carried the roots in baskets or wheeled them in barrows to clamps on the side of the field. Three clamps were made on one side of the field and three on the other. The people employed made good earnings.

Besides the employment of the labourer and his family, and the absence of injury to the land from the treading of horses, this practice, to judge from the above statement, appears to be quite as cheap as using horses and carts.

In seasons dry enough for carting off the beet, wheat is grown thereafter to a considerable extent instead of barley, and produces a superior quality of sample. Good crops of barley are generally grown after beet; as a preparation the leaves are ploughed in; it has been found that the barley-crop is inferior where the leaves have been carted off.

Swedes are frequently cultivated on the ridge in the same manner as beet, the seed being sown about the beginning of June; they do best on the ridge in a wet season, but in a dry one the ridges being cloddy and dry, the swedes do not grow well. Those who fat cattle cart the crop off the land before Christmas (November and December), and store in heaps near the fattening yards or along a headland in a stubble-field; some store them in a similar manner to beet, the heap rather smaller, but covered with straw only; some lay them in heaps between hurdles and then thatch with straw; others only cover with straw at first, as the swedes are apt to heat, but about three weeks after cover with earth: in this manner swedes keep sound till the spring. How much better this practice of carting roots from the soil and storing them, than carting a load of roots from the field daily, which are either covered with dirt or in a frozen state! By this tardy management the farmer's sheep and cattle are badly supplied with food, and his barley crop spoilt on account of the late time of sowing.

There is yet another way of managing heavy land for roots, which is coming into notice and appears to have great advantages, particularly as it does away with spring ploughing, and with another injury so often complained of, that of carting the manure on wet land in the spring.

The stubble is ploughed up early in autumn, and the land ridged in about 30-inch ridges (these are sometimes turned back), and then a dressing of farm-yard manure applied, spread, and covered in by splitting the ridges; in these operations the common plough is used. The land now lies exposed through

the winter to the action of the frost, and no more ploughing is given till the seed is drilled in the spring. The ridges are made across the direction the land is stetched up, so that when ploughing for the following year barley the furrows are laid in a contrary direction to the ridges of the root-crop; by this means the manure applied to the roots becomes equally distributed in the soil, and the barley is a level crop and ripens altogether, which would not be the case if the land was ploughed in the direction of the ridges.

This is undoubtedly the simplest and most effective way of securing a fine tilth for the seed. If weeds vegetate during the winter, they are destroyed by using the scuffler, or horse-hoe, over the land before sowing, and if considered necessary, the ridges are then moulded up with a small double-breasted plough. In that part of the county where this system is adopted, the mangel and swede seed is dibbled: one man will dibble about an acre in a day; the plants are first singled by hand and then hoed deeply. The shim, or horse-hoe, is used frequently between the ridges. The Rev. Copinger Hill, who adopts and advocates this system, has kindly favoured me with the following memoranda respecting the beet crop which he has grown under this system; the average of his crops is 20 tons per acre.

Memorandum of mangel crop, 1843; crop 20 tons per acre. Expenses of pulling up, stripping leaves, drawing, earthing up, and bringing haulm per ton, 7½*d.*

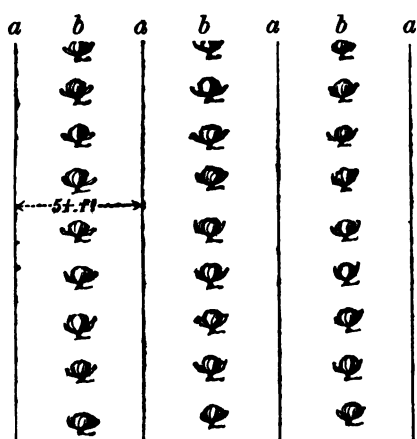
Expenses of clearing mangel in 1841:—

|   | <i>s.</i> | <i>d.</i> |
|---|-----------|-----------|
| Pulling, Carting, and Stacking 18 tons per acre | 11        | 0         |
| Bringing haulm for two coverings . . . . .      | 2         | 0         |
| Earthing up . . . . .                           | 3         | 6         |
| Total . . . . .                                 | 16        | 6         |

*Carrots.*—White Belgian carrots are grown by a few farmers: the manner of cultivation is drilling on the ridge or flat without manure, the seed being rubbed and mixed with sand to ensure delivery from the drill. Oats are often sown with the seed to show the rows, so that the hand and horse hoe can be used.

The subject of growing roots as a fallow crop is of so much importance that, at the risk of being considered prolix, I shall introduce the following description of growing roots, &c., as practised by Mr. J. C. Downing, of Earl Soham, who advocates the system of ploughing heavy land in 8-furrow stetches, using a whole drill (one that covers a stetch at one movement, the two wheels working in the furrows), and argues that roots may be carted off the land at this width of stetch without injury to the soil, as the stetch exactly fits the width of the wheels, and the

horse may be made to walk in the furrow by quartering the shafts of the cart.



Cabbages are not very generally grown, but Mr. Downing's plan appears to be advantageous, as it secures both a green crop and the benefits of a long fallow. *a a a a*, furrows  $5\frac{1}{2}$  feet apart; *b b b*, cabbages 21 inches apart in the row; rows distant from each other  $5\frac{1}{2}$  feet, or 3 rows in a rod.

By planting at the distance of  $5\frac{1}{2}$  feet, the injury done by carting on the manure and carting off the cabbages is entirely pre-


vented, as the wheels of the carts always run in the furrows. It takes 4826 cabbages to plant an acre (these, pricked out to 4 inches apart, are bought at 1s. 6d. per 1000); the planting is done from 4 in the afternoon to 7 or 8 in the evening; the plants thus have the advantage of the coolness and damp of night, and by that means gain strength to stand the heat of the following day, but during dull weather the planting may go on at any time.

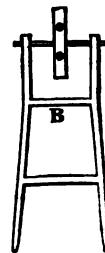
The cultivation between the rows is done by the common plough; the land is first ploughed away from one side of the rows of cabbages, cutting as close to the plants as possible, the soil is then turned back, each other space is left unploughed for 4 or 5 days, for this reason, that the ploughing is done so close to the plants that it breaks off a great number of roots, and if the roots on both sides were cut by the plough on the same day the cabbages would suffer, whilst, by ploughing on the other side 4 or 5 days afterwards, the roots that have been previously cut off short have time to send out an increased number of young fibres, which support the plant while the other side is undergoing the operation of ploughing. The benefit to be derived from the cutting off the roots is, the increased number of spongiolæ, or young feeders sent out by the broken roots; the plants, being furnished with a greater number of mouths, must, as a matter of course, take in an increased amount of food, which acts upon the plant by producing a quicker growth. The gentleman who practises this system of cultivating cabbages was told that it would not answer during dry weather, but he asserted that if the plan suited a wet season, he was sure it would succeed in a dry one; the ploughing

between the rows pulverizes the soil, and causes it to attract a greater quantity of moisture; the increased number of roots would, of course, extract from the soil a greater amount of water, and of those substances held in solution by the water. The fresh pulverized earth given by the plough is very acceptable to the cabbages; the land has an almost perfect fallow, and grows an excellent crop.

The carting off the cabbages is done in such a manner as to be productive of as little injury to the land as possible. This is done with a quarter-cart, as it is termed in Suffolk, having the shafts so placed that the horse walks before the right hand wheel; in other words, it "quarters." With this cart the wheels and horse are made to go in the two furrows, the body of the cart passing over a row of cabbages which are filled into the cart as it moves on.

Mr. Downing's plan of growing swedes and beet is somewhat similar to that adopted for cabbages, as it has the same end in view of making a fallow, and preventing injury to the land by carting. *a a a*, double rows of plants 15 inches apart; *b b b b*, furrows 4 feet  $1\frac{1}{2}$  inch apart, or 4 ridges in a rod; the plough, &c., is used repeatedly between the double rows. The manner of carting off is to have the horse walk in the furrow, *b*, and the wheels go upon the edge of the ridge at *a*, where the plants stood; but these have been pulled, topped, and tailed, and laid on one side away from where the wheels go, and are ready for throwing into the cart. Mr. D. uses a dibbler of the following construction for dibbling swede and beet seed: he gets a wheel from the iron foundry of about 18 inches diameter, has holes drilled in this, 7 inches apart, for 1s., then wooden

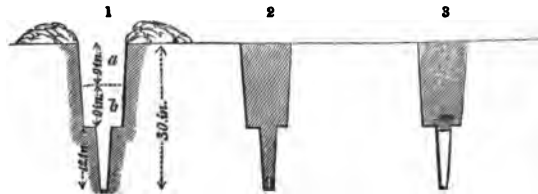
dibs about  $1\frac{1}{2}$  inch,  turned, and fixed in by a nail, the other part made by the wheelwright. If too light, he has a stone weight hung on the bar, *B*; with this he dibbles mangel and swede seed at 7 inches apart, dropping the *turnip* seed from a bottle with a large quill stuck through the cork, the seeds are dropped with a jerk, and it does capitally. In dibbling seeds like turnips, too many would be dropped into each hole from the fingers; but by



having a bottle as here described, the seed is dropped in equal number, With the same dibble he marks the ridges for cabbages at 21 inches, passing over 2 holes, and planting the cabbage in the third; and when transplanting swedes, he leaves every other hole. To secure a plant, he dibbles beet and mangel at 7 inches, but hoes up every other knot of plants, leaving them at 14 inches. His dibbler admits of one end of the axle moving further back, so that when dibbling ridges the man does not walk on the ridge but in the furrow.

The root-crop is variously used, and it may be said with correctness to be given to cows, fat and lean cattle, sheep, and hogs. Beet affords food for fat cattle during spring and some part of summer, and is sometimes given to fat sheep, and to ewes and lambs in the spring. Turnips are stored by some for fattening purposes; some remove them daily from the field where they grow, to be thrown out on pasture land for lean cattle or sheep, while others exercise the precaution of carting early from the field, and setting them up close together in some convenient spot of ground: the objection to this is, that the tops decay and make the roots in a dirty state.

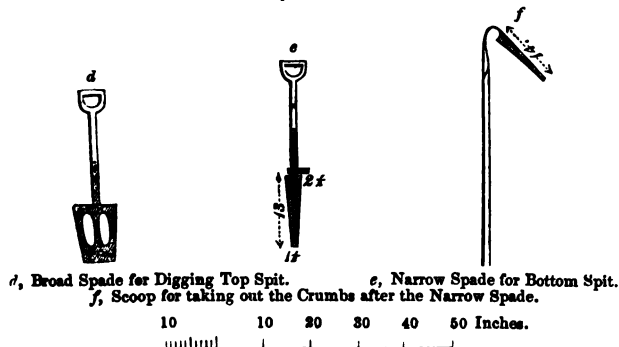
Draining on arable land is done during the fallow, and is as much



1. Drain before it is filled up. 2. Drain filled with tile. 3. Drain filled with turf.

Drain No. 1.

- a 9 Inches ploughed out.  
b 9 Inches dug with Broad Spade.  
c 12 Inches dug with Narrow Spade.  
— 30 total depth.




d, Broad Spade for Digging Top Spit. e, Narrow Spade for Bottom Spit.  
f, Scoop for taking out the Crumbs after the Narrow Spade.

10 10 20 30 40 50 Inches.

practised on the heavy land of Suffolk as in any of the adjoining counties; but as the reporters of those counties have already given full details of a similar system, I beg to refer to their reports, and to the excellent article of the Rev. Copinger Hill on Suffolk Draining, in the 'Journal,' vol. iv. p. 23. It would be useless to attempt to give a better description than that gentleman has done. I shall merely give a section of the common drains, and a sketch of the narrow spade used in taking out the lower spit, as well as of a spade which is sometimes used in digging the upper spit; it is half fork half spade. In digging stiff land with this tool, the advantage is in the ease with which it enters the land, and in the soil not adhering as it does to the common spade in wet weather.

Drains are drawn across the stretches, that is, across the direction the land is ploughed, and when new drains are required (the time of renewal depending upon the nature of the soil, though usually from 10 to 20 years) they are cut across the old ones; the materials used in filling up are "haulm" (stubble), straw, "scuds" (twisted straw), ling, or bushes; these are all used on the same principle, viz., that of a temporary means of forming an arch, for these substances decaying after a time, leave a passage for the water covered by a solid arch of soil. Plug-draining and the filling with turves, brought from the fens (the latter much used, as they save straw) are means of forming that

arch at once. Pipes, either circular or this shape  (the latter preferred because they fit the drain), are getting into use, particularly where supplied by the landowner; the drain is dug in the same manner as for the other filling materials. In putting in the pipes the man begins at the lowest end of the drain, and walks on them as he proceeds in his work. The cost for labour in digging out and filling in the materials, and the soil which has been thrown out, is on the average 4s. per score rods for 30-inch drains; when pipes are used the cost is rather more. Drains for pipes are sometimes dug 3 feet deep by digging two spits with the broad spade; this does not much increase the cost for labour, and may be of advantage, as it removes the drain further from the plough; it also admits of subsoiling, which is out of the question in the common method of filling in, as that operation would destroy the arch that had been formed. However, many of the heavy land fields of Suffolk are nearly at a dead level: hence it would be impossible to adopt a very deep system of draining, as a fall of water could not be obtained; even at the present depth difficulty is sometimes experienced in getting a fall, when the openings of the drains are only just above the level of the water in the ditch into which the drains run.

*2nd Year, Barley.*—On a long fallow the seed-earth is given

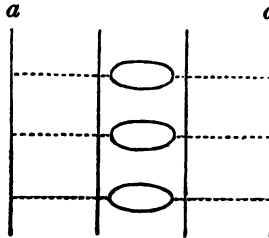
before Christmas; the land then lies till February or March, when it is scarified or well harrowed and the seed drilled at about 6 inches, with from 10 to 12 pecks per acre: a set of light harrows follow to cover the seed. The varieties usually grown are the long-ear Nottingham, and the Chevalier. This last was introduced by the late Dr. Chevalier, of Aspell, in this county; it is the finest, though not the hardiest or most productive kind of barley grown. A full account of the origin of this variety is given by Dr. Chevalier, in the *Journal*, vol. i. p. 11.

Land, for barley after roots, is ploughed as soon as the roots are off; across the ridges if ridged, some plough twice, giving a shallow ploughing first, and then a deep one; this is of advantage, as it brings the land level, and mixes the manure that had been applied to the root crop. The leaves of beet are ploughed in, and found to be productive of much benefit.

An improvement has of late years been brought into practice in some parts of the county, that of sowing about a peck of white mustard per acre on the long fallows in August or early in September, and ploughing in the herbage about 6 or 8 weeks from the time of sowing. To assist in covering it in, several methods are employed: the roller is used before ploughing, a chain is fixed to the plough, or, what is perhaps the most effectual plan, having boys to put it in the furrows after the plough; the effect on the barley crop is considered by practical farmers to equal half a coat of muck, obtained at a cost of 2s. 6d. for seed, and the additional trouble of sowing and harrowing in the seed. White mustard is sometimes sown for feeding, and it has also been sown after peas for ploughing in as a manure for wheat. Mr. Kembell, junior, of Buxhall, tested this practice by leaving a portion of land unsown: he states that the difference of the crop was visible to the eye at a considerable distance from the field; at harvest, the wheat where the mustard had been ploughed in was 6 inches the highest, and ripened 10 days sooner than the wheat on adjoining stretches where no mustard had been sown; this was on a clayey loam. Barley is horse-hoed by some farmers; this is of advantage, particularly where the system of late sowing clover seed is adopted; some consider that the land must be in a bad state if barley requires horse-hoeing, and are therefore content with hand-weeding.

On an average, 1 peck of clover-seed is sown broadcast by hand, or with the machine directly after the harrows which follow the barley drill: the land then receives another light harrowing. Another manner of sowing seeds, which is useful when the barley crop is sown so early that it is likely to be injured by the clover, is that of horse or hand hoeing the barley, and then sowing the seeds broadcast and harrowing in.

The manner of gathering barley at harvest is different from that practised on the light lands; here the barley is mown across the stetches or beds, and when fit to cart, is gathered by the wives of the harvestmen, who use hand-rakes for the purpose of rolling the barley into rows; they rake the swaths off three stetches into a shock, leaving a passage for the waggons in the furrows, *a a*.



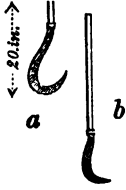
Barley is harvested either in the stack or barn, though more frequently in the latter; a greater quantity is got into the barns by trampling with horses, though this practice is occasionally injurious, from the barley becoming mow-burnt when badly harvested.

By far the greater part of the barley is threshed by the flail, at a cost of from 10d. to 1s. per coomb. Machines for hawelling barley, in lieu of the old-fashioned barley-choppers, have lately been introduced: these perform the operation perfectly, though many farmers complain that from the machines cutting the awns off so short, the barley does not fill the bushel so quickly as before the machines were introduced; however, as maltsters will pay for even samples, there does not appear any likelihood of hawelling machines being laid aside.

*3rd Year, Clover, Beans, and Peas.*—That portion of the barley-stubble intended for beans and peas is manured with farm-yard dung, usually from 14 to 20 loads per acre, and then ploughed up; this is generally completed before the frosts of winter set in, by that means exposing the land to the ameliorating effects of the weather during winter, and this adds another link to the system of avoiding spring-ploughing, and sowing on a stale furrow, which are, I believe, the strong points in the husbandry of the heavy-land farmers of Suffolk. Some farmers give a half coat of dung for beans, and the other half for wheat; the dung for beans is not ploughed in very deep, as it is considered that beans require a firm bottom, and that by ploughing deep for wheat the manure applied for beans will be brought nearer the surface. When drilling beans and peas is practised, the land is scarified before sowing to let in the drill, but for dibbling this is not required. Beans are planted from 6 to 8 rows on a 12 furrow stetch (peas rather closer), the time of planting February and March, but this depends on the weather. About 2 bushels of common small beans are planted to the acre, about 4 of Windsors and Mazagans, and from 3 to 4 bushels of peas. Beans are hoed twice, and sometimes three times, with a heavy hoe (by



some farmers the horse-hoe is used, and with much advantage), at a cost of 4*s.* for the first hoeing, and of 2*s.* 6*d.* or 3*s.* for the second. Some plant their beans on ridges, either one or two rows; if two, 8 or 9 inches apart, the ridges from 27 for one row, to 42 inches wide for two rows, and then plough and horse-hoe between the intervals. Beans are either pulled by women and children or cut with a hook, (*a*) "scrogged." Peas are either mown, or the pea-make (*b*) is used for the purpose.



Peas with barley are used to some extent for fattening pigs; beans for horses and bullocks. Bean-meal with oil-cake is frequently used, and is reckoned better than if they were given separately.

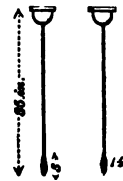
Manure is frequently carted on the clover in the winter during frosty weather; when this is done the land is not dunged for wheat; this is preferred by many, as the clover gets the benefit, and the wheat-plant comes better than when the manure is laid on a short time before ploughing for wheat.

Italian rye-grass is grown in some places in lieu of clover; it must be useful on land that is clover-sick, as allowing a longer interval to elapse before it is again sown on the land. Clover is sometimes mown for "stover," (that is, hay) the second crop being either fed or mown for hay or for seed, though some cart into the yards for horses. The manner of making hay has nothing remarkable in it to deserve a description.

Seed-clover is grown to a considerable extent; the practice is to feed red clover till June, and white till May (not folded), and then shut up for seed; the feeding with sheep makes the clover blossom more at once. Red clover is sometimes mown for hay, and then seeded; but the lateness at which the seed is harvested renders this an uncertain practice. Stones are picked off the layer during winter, and the thistles and other weeds chopped up a short time after the crop is shut up for seed. White clover is mown early in the morning and late at night in dry weather, for when damp the seeds do not brush off: this is not required for red clover; men or women follow the mowers with close-toothed iron rakes, for the purpose of collecting the heads of clover that fall between the swaths. The cost of mowing is from 2*s.* to 2*s.* 6*d.* per acre, that of raking about 1*s.* per acre. The clover is turned and lifted as occasion may require, a rake following each man that turns. When fit to cart, the seed is gathered in rows with hand-rakes in the morning, while the dew is on the ground, in a similar manner to barley, the intervals between the rows being sufficiently wide for the passage of the waggons; in pitching, the seed is handled as carefully as possible. When carting white

clover, women and children follow the waggons to pick the locks of clover left by the pitchers. After carting, the field is raked while the dew is on the ground. The seed is either threshed by hand or by the machine; the cost of "cobbing," separating the seed from the stalks, and "drawing," separating the seed from the husk by hand, is from 4s. to 5s. per bushel of 5 stone; seed is drawn on a wooden frame on which the cob is laid, while 5 or 6 men hammer away with flails; however, this is much better done by machinery. A crop of red clover-seed is 2 to 8 bushels, of white 3 to 9 bushels (of 5 stone) per acre.

*4th year, Wheat.*—Wheat follows in the last year of the course after beans, peas, and clover. From 14 to 20 loads per acre of farm-yard manure, generally compost, are applied on clover-lands for the wheat crop, either on the seeds during the previous winter, or shortly before ploughing up the land for wheat; the clover-land is ploughed up (not very deep) in September, allowing a short time to elapse before planting. When the layers have been fed, it is considered advisable, from the greater part of the manure from the sheep washing into the furrows, to spread the first furrow ploughed up; by this means the manure is distributed over the surface; if this is not done, the corn that grows on the ridge or top of the stetch is lodged. When manure is spread, it is never thrown in the furrows, for these become by ploughing the top of the stetch, on which the succeeding crop is grown; and it is found that that is the part where the crop grows with the greatest luxuriance. Wheat is generally planted in October or November, either with the drill or by hand-dibbling; the latter is preferred for clover-lands. The dressing to prevent smut was chiefly chamber-lye and lime; this has been superseded in many places by a solution of blue vitriol (sulphate of copper). Arsenic is also used; this is done by wetting the wheat, and then sifting arsenic over it from a dredging-box. Before dibbling the land is rolled. Dibbling is done by men who use two iron dibblers, one in each hand, walking backwards; one man finds employment for three children dropping the seed; the cost from 5s. to 8s. per acre; the distance between the holes varies from 3 to 5 inches, that between the rows from  $4\frac{1}{2}$  to 9; thus one row of holes is put in the centre of each furrow, or two rows on a furrow; and some put 16 rows on a 12-furrow stetch, putting two rows on the wide furrows, and only one on the narrow ones at the ridge and furrow. After the seed is deposited, the land is harrowed. Among the advantages of dibbling are—



- 1st. The employment of the labourer and his family.
- 2nd. The saving of seed (from 6 to 7 pecks usually dibbled).
- 3rd. That the straw grows stiffer, and is not so liable to be lodged.

Bean and pea land, that has been dunged for those crops, is not dunged for wheat, though some farmers give half a coat for beans, and the other half before ploughing the land for wheat. Clover is considered the best preparation for wheat. The bean and pea land is cleaned after harvest by scarifying and harrowing, and then ploughed. Drilling is generally practised on bean and pea land, and by some farmers after clover; the distance between the drills varies from 5 to 9 inches, with spaces of about 1 foot in width for striking out the furrows. The wide drilling, which Arthur Young speaks so highly of, has been laid aside, as it has been found, after an experience of many years, that it does not equal that drilled at narrower intervals. The land is harrowed both before and after the drill, a light gang of harrows being used last for covering the seed. The furrows are now struck out with a double-breasted plough, drawn by one horse, which leaves the wheat well laid up for the winter. The quantity drilled is from 8 to 10 pecks. The red varieties chiefly grown are, the Spalding, the Copdock or marygold, and the old Kent red. The Tunstall white, grown from a single plant at Tunstall, Suffolk; the Hardcastle, a white wheat, brought into notice by a farmer of that name living near Ipswich, and a great favourite with the Suffolk farmer; some grow red and white wheat mixed, a sample which commands a higher price in the market than red only.

Horse-hoeing wheat is only partially practised, though hand-hoeing and weeding are very general, but perhaps are productive of some injury when done too late in the season.

By far the greater portion of the wheat is reaped, and for such abundant crops as are generally grown this is preferable to mowing; however, mowing or bagging is to be recommended on land intended for beet or tares, requiring to be ploughed up immediately after harvest.

Harvestmen are either paid a certain sum per month, or receive about 10s. per acre for cutting, carrying, and stacking the grain, from 10 to 12 acres being allotted to each man, the wives and children assisting in the harvest when required by the men.

A great quantity of wheat is still threshed by the flail, at a cost of from 1s. 2d. to 1s. 6d. per coomb; and I believe that there are covenants in some leases binding the farmer to thresh by flail, and that some farmers prefer it, because they are able to employ more labourers, who otherwise would be obliged to fall on the parish. I think that landowners and farmers of this opinion require a little more schooling to convince them that money saved by machinery can be employed in improved cultivation.

#### *Management of Light Land.*

I have included the eastern and western light-land districts

under one head: this may be objected to, but the prescribed limits of this report will not allow of any other arrangement. The management, in some respects, may be different, but, where any difference occurs, it will be mentioned. Many of the light-land farms on the eastern side of the county are of so varied a character of soil as to require distinct systems of management, and may be said to partake both of light and heavy land farming. It would, therefore, require a considerable space to give all the details, and this must be my apology if I have omitted any important features. Beet-root is grown largely on the eastern side of the county on good soils, and has perhaps in some measure superseded the cultivation of carrots, for which the light land was celebrated in the time of A. Young. The proximity of the sea, combined with dry and warm summers, no doubt render this district favourable to the growth of that root.

The whole of this district is (with very little variation) farmed on the four-course system:—

1st year—Fallow, swedes, white turnips, carrots, or mangold-wurzel.

2nd year—Barley.

3rd year—Seeds.

4th year—Wheat.

On the very light sands swedes and mangold are not grown, and rye is grown as a corn-crop; but the latter is not so much cultivated as it used to be. Oats are occasionally grown instead of barley and wheat.

*1st year, Fallow.*—On most of the farms in this district a breeding-flock is kept, and in order to supply food for the ewes and lambs in the spring, in the interval that elapses after the turnips are consumed, and before the layers are sufficiently advanced for feeding, a portion of the fallow is set apart for the growth of rye for feeding off, to be followed by white turnips. As soon as possible after harvest, a portion of the wheat-stubble is ploughed up. The cleanest stubble is generally selected for this crop, though on some farms the practice is to take rye for feeding alternately on the several fields of the shift; one ploughing is given, and the seed drilled or sown broadcast (if drilled, the coulter of the drill is as close as possible), at the rate of from 3 to 3½ bushels per acre; the quantity of seed may appear great, but it is generally considered that rye for feeding cannot be sown too thickly. A few tares or rape-seed are sometimes sown with the rye; this thickens the bottom of the feed. Within the last few years an early variety has been introduced, for the purpose of feeding off in the spring; it is called the giant or Tyrolese rye, and it has the great advantage of coming a week or ten days earlier than the common rye, though some farmers do not consider the

produce equal to, or the feed to continue so long as that produced by the common variety, but this deficiency, if it exists, is more than compensated by the advantage of having feed 10 days earlier; this is of great importance to the flockmaster when the spring is severe, or when there is a short supply of turnips. The time of feeding off the rye is of course determined by the severity of the winter, and by the time at which the turnip-crop is consumed. The usual period being from the middle to the latter end of April, if allowed to get too forward the sheep do not eat it readily. The sheep are usually folded in hurdles on the rye, a fresh piece being allowed them every day. Some of the hurdles are set so that the lambs can get through and feed on the fresh rye at the head of the fold, whenever they feel inclined. It is the practice of some farmers (and one which is much to be recommended when the turnip-crop is abundant) to cart the last of the turnips into the rye-field, and give them to the sheep while feeding the rye. The cost of carting the roots will be amply repaid by the convenience of being able to proceed in the sowing of the barley-crop at a seasonable time; the loss to the land by not being folded can readily be supplied by some artificial manure. Green rye, in a forward state, is often mown for horses, and cut into chaff with a mixture of straw; it is useful as affording the first gradual change from the dry food of winter to the green food of summer.

The cost per acre of rye for feeding is rather heavy; but, at present, the Suffolk farmers have not discovered any crop that so well fills up the blank between the consumption of the turnip-crop and the time at which the grass and clover are ready for the sheep.

As soon as the rye is fed off, the land is ploughed up and prepared for turnips, which are drilled about the latter end of June or beginning of July. The number of ploughings, scarifyings, &c., which the land receives depends upon its cleanness, and also on the difficulty that exists in bringing the rye-land into a sufficiently pulverized state. Farm-yard manure is seldom used for turnips after rye, but artificial manures, such as rape-cake, bones, and latterly guano and superphosphate of lime, are frequently drilled in with the turnip-seed.

A farmer in the neighbourhood of Wickham Market grows swedes and white turnips after rye with only one ploughing, and never fails of securing a good crop.

On most farms a few acres of tares are sown for the purpose of soiling horses, or occasionally for feeding sheep. The management does not materially differ from the cultivation of the land for green rye.

Having thus disposed of a portion of the fallow (on some farms about one-fourth of the entire shift), I shall proceed to consider

the plan of working the remainder. The manner of preparing the land for turnips is not uniform in this district, and the practice frequently varies on the same farm, one system being adopted one year, and another the next. If a dry autumn succeeds an early harvest, we shall in all probability see the *whole* of the fallows cleaned of couch and other rubbish *before* the clover layers are ploughed for wheat; but if it happens to be a wet autumn, or a late harvest, the cleaning is of necessity deferred till the spring. The practice of some farmers is to skim-plough as soon after harvest as possible, the skim being either a skeleton-plough fitted with a share of from 14 to 16 inches in width, with three short prongs of iron rising from the share in the annexed form, for the purpose of breaking the land; or it is a common plough divested of its mould-board, and fitted with one of these broad shares.



Upwards of  $1\frac{1}{2}$  acre of hard land may be thus ploughed with a pair of horses in a day.

The advantage of the skim-plough over the scarifier in breaking up stubbles is that it will enter harder land, and it does not choke as scarifiers and cultivators do in these soils, from the quantity of hog-grass or wireweed with which the stubbles are sometimes covered after harvest; besides, the sandy and gravelly soils are more subject to couch than perhaps any other description of land. After the land is broken up with the skim-plough heavy harrows are used to pull the land a little to pieces, and to bring the clods to the surface; the roller is then employed to break the clods, which generally leaves the land in a sufficiently pulverized state for the lighter harrows that are now used for collecting the rubbish into rows in regular lines across the field and on the headlands. The man who drives the harrows is accompanied by a strong lad, who assists in unloading them. The rubbish collected in this manner is either burned or carted off. The scarifier is now used across the ploughing, and the harrowing repeated, when the chief portion of the rubbish is thus pulled out of the land by the scarifier and collected by the harrows; any straggling pieces of couch-grass are picked up by women and children. The plan of raking the couch-grass and other weeds from the land, after they have been pulled to the surface by harrows, is sometimes adopted; and, when the land has been finely pulverized, it is a very effective way of collecting the rubbish. Large companies of women and children, accompanied by an overlooker, are often employed either in picking or raking; and when the couch, or spear grass, as it is here termed, only occurs in small patches, it is very common to have these forked out piece by piece previously to the stubble being broken up. After the land has been cleaned in this manner, it is ploughed in wide stretches (usually 3 rods).

Another system of fallowing is adopted by many, namely, that of "ribbling;" this is done by turning a furrow to the unploughed land, and, in returning, to turn over this furrow and the earth upon which the first furrow was laid, so that the land lies in ridges during the winter months, and is thus exposed to the full action of the weather. In the spring these are harrowed and scarified across, and then ploughed.

Others merely plough the stubble in, and then let the land lie through the winter, when the furrows are turned back, bringing the couch grass, if any, to the surface; instead of turning back the furrows, some adopt the plan of "ribbling," in the spring, across the first ploughing, and by this means bring the couch to the surface; the land is then cleaned with the harrows and scarifier in the usual manner.

The custom of ploughing in the stubble is the old-fashioned method, which many still consider the best, and give the following reasons for their opinion: the stubble, and all rubbish in the shape of weeds except couch, will rot during the winter; and not only spare the trouble of getting together and carting them off the land, but will tend to increase the fertility of the soil. This is the opinion of some: and undoubtedly it is good management when the land is perfectly free from couch, and other creeping-rooted weeds: but where an opportunity occurs of cleaning foul land in autumn, it must be wrong to defer doing so till the busy time of spring. How often it happens that the soil during the months of September and October is in a better state for cleaning operations than at any other period between that time and turnip-sowing.

The following description of the preparation of the land for roots applies to a particular farm, though the system in some degree resembles that practised by the neighbouring farmers. The land on this farm is a sandy loam, in some parts inclining to brick earth. The practice of ridging is adopted on the stiffest land, and also that of subsoiling. In these respects the management differs from that practised on the very light sands, where the turnips are drilled on the flat; though where the land partakes at all of a clayey or loamy nature, the ridge system is generally adopted for swedes and mangel.

"Preparatory to ridging or ploughing in the manure, the land is brought into as pulverized a state as possible; this being considered indispensably necessary for the success both of ridge and flat cultivation. No regular system of preparation is adopted; as this, of course, depends upon the weather, and on other circumstances requiring the exercise of proper judgment as to the course to be pursued. But one maxim is adopted: that of cleaning the land from couch and other weeds *in the autumn*, when possible; and to aid in accomplishing this end the practice of mowing wheat

lends a helping hand. This cleaning is performed by the due application of the skim-plough and scarifier, with harrowings and rollings as occasion may seem to require. In addition to what has already been stated, the spear-grass and other weeds torn out by the scarifier are collected by repeated harrowings, rakings, and hand-pickings, and are then carted off the land. When the land is brought into a perfectly clean state—and when the weather and the other more pressing operations of the season, such as wheat-sowing, carting-off, and storing away roots, will allow—the plough followed by a subsoil plough (the Rackheath or Reid's sub-pulverizer), the latter drawn by three horses, is set to work. The land is thus stirred to the depth of 14 or 15 inches, and lies exposed to the full action of the frost during winter. This will in all likelihood complete the preparation till the ploughing-in the manure and drilling the seed. In order to prevent the trampling of the horses on the subsoiled land, the horses in the common plough walk on the unploughed land, instead of one walking in the furrow where the subsoil plough has just been. The line of draught is adjusted by altering the head or bridle of the plough. In shutting up the furrows the horses are made to go at length instead of abreast. By adopting this plan the poaching the land is prevented. This may not appear to be very injurious at the time; but the parts compressed by the horses' feet will in wet weather be found to hold water.

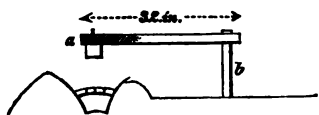
A wet autumn and winter will not allow these operations to go on so smoothly. We must then be content with simply ploughing the cleanest fallows, and with using the skim-plough or scarifier across those that are foul. Any further attempt at cleaning is left till the dry weather of spring commences; and having got rid of the couch and rubbish by the same system of operations as before described, ploughing is resorted to in order to bring a sufficient depth of mould. But by ploughing at this season of the year, clods are very likely to be produced. To pulverize these the land is always kept harrowed and rolled *immediately* after the plough. If these do not bring the soil into a fine surface, recourse is had to that very effective implement, Crosskill's clod-crusher. Another ploughing may succeed with the same accompaniment of harrowing and rolling. And taking it for granted that these operations have been done at proper seasons—viz. when the land is neither saturated by recent rains nor hardened by long-continued drought—the field ought by this time to have a sufficient quantity of fine moulds for ploughing in the manure, and drilling the seed to the best advantage, and in a workmanlike manner. During the winter the farmyard manure intended for the root-crop is carted to the field, and laid in the most convenient places for its future application on the land at the time of turnip-sowing. Wet weather is



generally taken for carting from the yards: no particular season is chosen. The muck is either laid on a bottom formed of clay, mould, peat, or ditch stuff; or sometimes it is laid in a heap without any heavy material. In unloading, the carts are drawn on the manure heap, and kicked up; a man being employed spreading the manure as it arrives. The pressure given to the dung by the loaded carts of course prevents loss by decomposition. The manure is taken from different yards, so that the dung may be mixed in the heap. A few weeks before carting on the land the dung-heap is turned over; should it consist of dung and earth, care is taken to mix these well together. Fermentation now commences; and the manure requires to be applied to the soil before this advances too far, or a great loss will be sustained in the bulk of the heap.

The land and manure being thus prepared at due time, the process of covering in the manure commences. It is first to be considered which practice is to be adopted, ridging or flat-work. On very dry land the latter has the preference: but on good land ridging may be adopted with a certainty of getting a good crop. On heavy clays, where there is no possibility of reducing the clods to a fine state, no advantage will attend ridging, except that some facility is obtained for carting off the roots. However, ridging may be adopted on heavy soils if the land is prepared in the autumn.

When the ridge-system is adopted, the ploughman begins by drawing out a few ridges preparatory to the general beginning. By giving him a slight start stoppage is prevented. The ridges are



made 27 inches apart, and to keep these of the exact width a marker is attached to the plough of the annexed form; this is placed upon an iron pin *a* at one end of the beam, the other end being secured by a line from the head of the plough. The part *b* of the marker draws a slight furrow, in which the ploughman can go with unerring correctness; at the end of each furrow the ploughman changes the marker to the other side of the plough.

When a few ridges have been ploughed in advance, the other operations follow. The manure is carted, spread, and covered in; the ridges rolled, and the seed drilled, in rapid succession. About 3 acres are completed with two ploughs in a day of eight hours. The workmanlike style in which the ridge-system is carried out by some of the Suffolk farmers will, I have no doubt, bear comparison with the best cultivated farms of the north of England.

In addition to the farm-yard manure, some artificial manure

is sometimes drilled on the ridge; this is done with a manure drill, the coulters of which are guided by rollers which at the same time roll the ridges. The seed is not sown by this drill, for as the manure coulters make a very deep furrow it would be unwise to deposit the seed immediately. But by using a light roll, this furrow is filled up, and the ridge levelled for the seed-drill to deposit the seed at a regular depth. Guano is sometimes sown by hand, in immediate contact with the manure; this is of course done before the ridges are split.

Before hand-hoeing the turnips or beet, they are horse-hoed, a man and horse getting over about 3 acres in a day; between the first and second hand-hoeing the horse-hoeing is repeated, and after this as often as may be required.

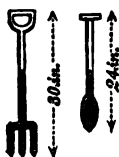
The spaces in the mangel or turnips, which have missed plant, are filled up with transplanted swedes. Swedes are also transplanted after tares that have been mown for horses, and are found to produce good crops.

The system of drilling on the flat is generally adopted on nearly all the lightest land of this district, both for swedes and common turnips: when farm-yard manure is applied, it is carted on and spread just before the ploughs, so that as short a time as possible elapses between the spreading of the manure and the covering of it in by the plough—it being so arranged that the men spreading, followed by women and boys to divide the dung, are just able to keep the ploughs in work. Some plough the manure in fleet, and then plough deep before sowing. Most farmers drill directly after the plough, and some, in order to ensure a good crop, drill artificial manure with the seed, such as rape-cake, greaves, bones, superphosphate of lime, &c.

On a few farms peat-ashes are used. I have before said that there is a narrow tract of peat soil on the banks of the river Lark, and this is prepared by being burnt in large heaps, at a cost of about 5*l.* per thousand bushels for digging and burning; these ashes have been used rather extensively on a few light-land farms for turnips; they have likewise been found to be productive of much benefit when applied as top-dressing on sainfoin and clover layers. The gentleman who first introduced the use of peat-ashes has also another practice worthy of mention, which is, the using two drills, one to sow the artificial manure, and the other to drill the seed; this is preferred, the seed being deposited regularly, and at a uniform depth, which is seldom the case when the seed follows immediately after the large manure coulters. This is a desideratum which is still wanting in drills made for the purpose of drilling manure with the seed. The time for drilling swedes is May and June; white turnips, June: the average distance between the drills 18 inches. Some farmers have adopted the practice of horse-

hoeing their flat drilled turnips, and it is a practice very likely to increase; as, in addition to the advantages derived from the pulverization of the soil and the destruction of weeds, the process of hand-hoeing is rendered easier and more effective. Garrett's lever-hoe is used by many farmers on the light land of East Suffolk. One gentleman, who farms 2200 acres, hoes turnips both between and across the drills, cutting out the plants at regular intervals; these are singled by hand and then hand-hoed. In the first hand-hoeing, or singling of the turnips, the hoer is often followed by a girl or boy to single the turnips left by the hoe. In about a fortnight the turnips are hoed a second time, the cost of both operations being about 6s. an acre.

Carrots are either sown broadcast or drilled. The land being ploughed deep or subsoiled, farm-yard manure is seldom used, as it makes the roots fangy. The management of the carrot-crop is frequently by contract labour; the contractor finding seed, sowing, hoeing, taking up and storing the crop: for this he takes half the crop, or is paid 2d. per bushel. About 5 lbs. of seed is sown to the acre in April, the seeds being first mixed with dry sand to ensure its delivery. As soon as the young plants can be distin-



guished, the weeds are hoed with a small hoe about 3 inches wide, having a handle little more than a foot in length; this is a very slow and tedious operation. In a short time the carrots are set out at about 6 or 7 inches apart with a wider tool, and again hoed about the latter end of July. The cost of hoeing varies from 20s. to 30s. per acre. The carrots are taken up in October or November;

men and women take them up with forks, or with a spoon-shaped tool; children cut the tops off as they are taken up.



They are then laid in long heaps, either in the field, or carted to some convenient spot; these heaps are about 3 feet wide at bottom, and 2½ feet high. They are first covered with straw, and then with earth, except the ridge, which is covered with straw only. In the spring the stored carrots require looking over. The tops are folded with sheep.

Drilling carrots is practised by some, and has several advantages over broadcast, as, first, it lessens the cost of hoeing; secondly, the carrots are singled at wider intervals, consequently they produce a heavier crop, as the roots are larger and the carrots being at greater distances apart the taking up is not so expensive. Before drilling the seed is mixed with sand, bran, or other substances to divide the seed. One farmer uses powdered wood-charcoal; the latter produces a quick vegetation of the seed, and also prevents it from

adhering in the drill ; it is thus drilled as regularly as the nature of the seed will allow : the drillman will, however, most likely object to this admixture, as the charcoal-dust gives him much the appearance of a chimney-sweep. The land harrowed before, and rolled before and after drilling with a very light roller ; the distance between the drills on light land is about 1 foot. The carrots are up in about three weeks, and in about a fortnight more the rows will be sufficiently visible for a 6 or 8-inch Dutch hoe to be used between them ; in about a week or ten days after the Dutch hoeing the carrots are singled out with the common hoe, selecting all the strongest plants at about 8 inches apart ; this costs from 5s. to 6s. per acre, and in three weeks or a month they require another hoeing.

The crops of carrots vary from 400 to 1400 bushels, or from 10 to 30 tons per acre. The purposes to which they are applied are feeding horses, cows, and fattening bullocks, for all of which they have been proved excellent.

This is the system practised on the western light lands. I am indebted to J. Rodwell, Esq., for a description of that of the eastern district :—

#### *“ The Cultivation of White Carrots.*

“ Choose a clean piece of wheat or barley stubble, supposing it to be free from grass : in November or December give it a dressing of from 12 to 15 loads per acre of farm-yard manure, then plough it in with a flat ploughing of about 4 or 5 inches deep : in about February or March give it a ploughing of about 9 inches deep, followed by a subsoil ploughing of about 5 or 6 inches additional depth, making the soil all broken at least 14 inches deep : it then lies till about the middle of April, when give it two or three heavy harrowings to destroy the surface weeds, then follow this with a 2-horse roll to keep in the moisture and again to encourage vegetation ; it then lies in this manner till the time is come for putting in the seed, which will be about the last week in April or the first week in May ; then give it two or more harrowings as may be required, followed again by a 2-horse roll if the land is dry or cloddy, if it is not, a light barley roll is preferable ; it will then be prepared for the seed, which should be put on with the drill as follows :—

“ The seed is laid in water in a bag for 48 hours about 8 or 9 days before drilling ; it is then taken out and spread on a floor about 9 or 10 inches thick, according to the temperature of the weather, so as not to let it get too warm ; in about 6 or 7 days' time it will be nearly sprouted, when it will be quite time to put it in the ground, at 4 lbs. or 5 lbs. of dry seed to the acre, which deposit by mixing dry sand with it, making up altogether sand and seed mixed 4 pecks or thereabouts, according to the dryness and fitness of the seed for working through the drill ; then follow the 1 or 2-horse roll with the drill as above mentioned, the rows at about 9 or 10 inches apart, the land after the drill being left with the drill marks quite open ; the land is then left till fit for hoeing, which

comes on between the rows in about 20 or 25 days; the expenses of hoeing will vary according to season, but average from 15s. to 25s. per acre, when the land is to be left quite clean, and the plants all singled, so as to be about 8 inches apart in the rows. The time for taking them up will be about October or November; the expense of taking up will be from 8d. to 10d. per load of 40 bushels, according to the crop, which, upon a good sandy soil, will produce from 20 to 25 tons per acre of this invaluable root.

"The method of preserving the crop is to pack them in heaps of 20 bushels each in the field, covering them with a little *dry* straw, and over that about 3 to 4 inches of earth; they are then quite safe for the winter; but if the land is intended for an early crop, and it is necessary to remove them from the field, then lay them in rows about 3 feet wide at bottom, and throwing them up loosely in a conical form, and covering them with dry straw and earth in the above method. They will be found very nutritious food for every kind of cattle, and especially for the cart-stable, where we substitute 1 load or ton of white carrots as an equivalent to a coomb of beans when ground, or 2 coombs of oats, beginning to feed with them in October, and continuing till May. Allowing 1 load of 40 bushels of carrots and 3 bushels of ground beans, or 6 bushels of oats, to a stable of 6 horses, per week, giving them chaff with their corn and carrots, this, with straw (having neither hay nor stover), constitutes their food during the winter, maintaining them in good working condition. After the crop is taken off the land, spread the tops of the carrots as carefully as a dressing of farm-yard manure, then give it a good sound ploughing, making an excellent preparation for a crop.

"*Note.*—A proof, if proof were necessary, of the great utility of this root, is at this moment fully experienced on this farm, having horses, colts, oxen, cows, and swine feeding upon a crop of upwards of 20 tons to the acre, and this in a season when the white turnips are almost a failure in quality, the swedes are deficient in quantity and quality, and the beet-roots are entirely a failure; and when beans are 56s., and oats 32s. to 36s. per quarter.

"THOS. SCOTCHMER,

"Bailiff to Joshua Rodwell, Esq.

"*Alderton Hall, Suffolk, Jan. 11, 1847.*"

On those farms where only a breeding-flock is kept, the whole of the turnips are consumed on the land, and this is perhaps necessary on the very light blowing sands; but another system is practised by some, that of carting off a part of the turnips for feeding cattle, in the proportion of one-third or upwards, when the land has been manured, and the system of grazing sheep on the turnips: and wherever these two systems are adopted in preference to the practice of consuming the turnip-crop entirely by breeding ewes, the benefit may easily be seen. A great objection to keeping only a breeding flock is the difficulty of providing spring food for so great a number of sheep and lambs, while grazing sheep can be sold at any time. It is generally considered

by the best cultivators that a flock part grazing and part breeding is the most profitable to keep. It is a practice of some farmers (though not much to be recommended) to have their turnip-crop fed off by other persons' sheep at a certain rate per score. They certainly run no risk by investing their capital in sheep, but they are very liable to have their turnips fed off at an unseasonable time. And I have known when turnips have been very abundant, that those gentlemen who farm without any stock are glad to have their neighbours' sheep and feed them gratis, and sometimes give money in addition; and even occasionally dispose of part of their root-crop by ploughing them in.

Notwithstanding the prescribed limits of this report, it may not perhaps be out of place to give the details of the practice of grazing sheep on turnips. The farmers who practise this system either buy in lambs or shearlings, or fatten those they have reared. These are huddled first on white turnips and then on swedes; the practice of cutting is on the increase, the turnips having of late years been cut with a machine and then given in troughs. This makes a slight increase of labour, but it effects a great saving in the food: the cost of tending amounts to about 1*s.* a score per week. Chaff (cut hay, the straw of oats, wheat, or peas, or the stalks of seed-clover) is given night and morning both to ewes and fatting sheep, the latter having generally hay-chaff, with the addition of linseed-cake or corn. As the fold is frequently at a considerable distance from the homestead, a supply of chaff and cake is kept in a small wooden house on wheels, which not only serves to keep the provender dry, but is also a comfortable shelter for the shepherd and his assistants while getting their meals. The troughs in which the dry food is given are usually covered, to prevent loss from the sheep refusing to eat the chaff and cake after they have been wetted. In very wet weather and on a loamy soil the sheep are removed to some dry pasture for a short time, as the trampling in very heavy rains is considered injurious both to the land and to the sheep. Swedes for fat sheep are stored in different ways: the usual one is in small heaps of about 40 bushels each. The turnips are either topped and tailed, or the tops only removed; the heaps are covered with straw and haulm, and then a thin layer of mould, leaving the straw exposed on the ridge to admit the air. The price for this varies from 7*s.* to 10*s.* per acre, according as the turnips are cleaned or not. Another plan is by laying three drills in a furrow; two rows of turnips are first pulled and laid on one side to give passage for the plough, a furrow is drawn, and three drills of turnips laid with their tops to the land-side; they are now covered by the first-ploughed furrow being turned back. When wanted for use the turnips are thrown out by running a plough along the furrow.

This practice, or modifications of it, is adopted for white turnips as well as swedes, and is well suited for turnips that are left late in the season, as the former is for feeding during the severity of winter. The salutary check which the turnips receive by being pulled prevents their drawing the land by sending up seed-stalks, and, being in a more natural position than when stored in heaps, they keep sound and in good condition. Beet and swedes for feeding on the land with sheep are sometimes stored in the following manner on the eastern side of the county:—The roots are pulled from a piece of land 6 yards square, and laid in the centre of this piece in a conical heap; a few roots in the centre of the heap are topped and tailed, the remainder are laid with the tops to the outside and covered with earth 6 or 8 inches in thickness. Roots stored thus are said to keep well. The employment of the labourer and his children is not the least of the many advantages which the harvesting or storing of roots affords.

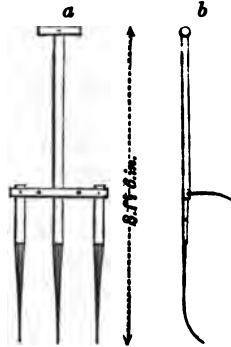
Sheep grazed on turnips are sold fat from March to June; the kind of sheep preferred for grazing is the first cross between the Down and Leicester. The breeding of this kind of sheep is much on the increase, as it unites the quickness of fattening of the Leicester with the hardiness and quality of the Southdown. This description of sheep is supplied by flock-masters who keep a Southdown flock (buying in ewes of that kind as the crones are drafted out), and hiring or purchasing Leicester rams of farmers who keep a Leicester flock for the purpose of ram-breeding. For breeding-ewes the turnips are never cut with a machine, and but very seldom stored, white turnips being generally given. Mr. Freeman, of Henham, steward to Lord Stradbroke, feeds his ewes on swedes, and I believe finds that they do better than on common turnips.

The sheep are folded on the turnips at night, and in the morning are driven out on the heaths (on the very inferior soils), or on some dry pasture, where they remain till about three o'clock; they then return to the fold to a fresh piece of turnips and a bait of chaff. This system of management continues till lambing-time, after which the ewes and lambs are generally put on rye, and then on the layers, which carry them through the summer. The custom of night-folding the breeding-flock is general.

*2nd Year, Barley.*—As the turnips are cleared off, the land is ploughed for barley. Some farmers give only one earth, others two, ploughing first very fleet, and deeper the next time, by that means the droppings of the sheep are well incorporated with the soil, and others again scarify or ribble after the fold, and drill the barley on one earth; the plan of ploughing fleet and subsoiling has been adopted by some. The barley (Chevalier or Long-eared Nottingham) is usually drilled at the rate of about 3 bushels

per acre, distance of rows from  $4\frac{1}{2}$  to 8 inches; rape-cake is sometimes drilled with barley, or sown broadcast before the last ploughing. On one farm 2 bushels of seed, and sometimes less, have been drilled at  $4\frac{1}{2}$  inches, generally producing a better crop than the larger quantity. It is generally found that the early-sown barley produces the best crop, and hence the advantage of clearing off the turnip-crop as early as possible.

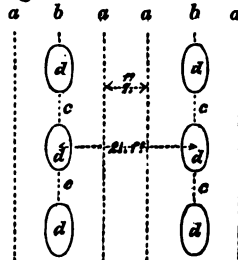
Wheat has been substituted for barley of late years on some farms after beet and carrots, and after turnips that have been fed off early. Very few good crops are secured by this method after turnips; I have seen better crops after carrots carted off the land than where the turnips have been folded. On the very light soils rye is sometimes grown instead of barley, particularly where the turnips have been fed early. Some farmers *prefer* rye after turnips. The manner of harvesting barley differs from that of the heavy-land districts. When fit for carting, the swaths are gathered into shocks with a shack-fork, (figs. *a* and *b*). In gathering corn with a shack-fork three swaths are laid in one row. The workman proceeds by pushing the corn with his fork till he has it full; he now lays this on the middle swath. At the end of the field he turns back and gathers the swath on the other side of the shock, the method of doing this will be better shown by the following diagram.



The swaths *a a a* are gathered and laid on those marked *b b*; the intervals *c c c* are also gathered, and in this manner the shocks *d*, as they are here called, are formed ready for pitching on the waggons. But previous to this the spaces between the shocks are raked with a horse-rake.

*3rd Year, Seeds.*—The small seeds are by some sown at the same time as the barley; by others after the barley appears above ground. There is more difficulty of securing a plant by the latter method; but there is no fear of spoiling the barley by the seeds getting too forward. The manner of sowing is either with a wide broadcast drill or with the hand; the quantity sown about 1 peck of red clover,  $1\frac{1}{2}$  trefoil,  $\frac{3}{4}$  peck of white clover, and 3 to 4 bushels of sainfoin respectively. Rye-grass is frequently sown mixed with clover and trefoil.

Mr. R. Raynbird, of Hengrave, sows seeds (clover, sainfoin, and rye-grass) in the following manner. Instead of the usual





practice of sowing broadcast, the plan of drilling small seeds with a light one-horse drill has been adopted:—This is not done till after the corn has come up, sometimes it is even 4 or 5 inches high; the drill is followed by a light gang of harrows, which complete the operation by covering in the seed after the drill. The land is drilled and harrowed across the rows of corn, the distance between the seed-coulters  $4\frac{1}{2}$  inches. Independently of securing a good plant, the benefit derived from the destruction of weeds, the loosening the soil, and breaking the surface-crust amply repays the extra expense. The harrowing may appear to be injurious by pulling up a few blades of corn; but the benefit to the crop is visible a few days after. On very poor land the seeds, trefoil and rye-grass, are allowed to remain two years, and sainfoin sometimes for four years; the latter is perhaps one of the best crops that can be grown on the light soils, and by laying the land down for four years it makes no break in the rotation. As a substitute for clover sainfoin is sometimes sown, and the following year ploughed up for wheat: it is generally believed that the 2nd and 3rd years' sainfoin is much better than the 1st, but very abundant crops of hay are produced by letting it lie one year, and it is a good preparation for wheat. However, on land of inferior quality, sainfoin is undoubtedly more profitable if allowed to remain four years. Sainfoin should be mown the first year, and then fed with lambs, for if fed with sheep they injure the plant by biting off the crown.

The layers are chiefly fed off with sheep, though a portion is mown for hay, and a portion is also occasionally seeded.

On the very poor soils the sheep have the whole field to feed upon at once, but upon soils of a better description the layers are frequently hurdled off with fatting sheep early in the season, oil-cake, corn, and mangel-wurzel being given in addition to the clover or grass. Sheep are regularly night-folded on the layers through the summer and autumn; upon the inferior soils folding is the principal preparation for wheat.

*Management of Sainfoin for Seed.*—Land rolled in the spring, and the stones picked the same as for a hay-crop. The seed-crop is usually fit to cut about the beginning of July, but the time varies with the season; this as well as all other seed-crops of the same species of plant is best cut either early in the morning or late in the evening, as the seed is much more liable to brush off the stalk during the heat of the day than during the cool and dampness of the mornings and evenings. The mowers will rest during the worst time for hard labour. Two or three days after cutting, the seed may be turned, and, should it continue fine weather, the crop will be fit to cart in six or seven days. In unfavourable weather the swaths will of course require lifting and

turning. On the morning of carting the swaths are gathered into rows sufficiently far apart to allow the passage of a cart or waggon, a horse or hand rake being first used in the intervals. The gathering should be completed before the sun bears much power, or much of the seed will be brushed out in the act of moving the swaths. As soon as the sainfoin is dry the carters may be set to work, but care must be taken to handle the seed as carefully as possible, or some loss will be sustained. The seed is said to keep best in the stack. The stalks appear rough and sticky, but if cut into short chaff they will make useful provender, and many farmers consider it equal to hay.

Italian rye-grass is grown instead of clover on some of the better soils, and has produced very abundant crops,—the quantity sown per acre is about 2 bushels. A description of the plan followed by some farmers in harvesting this crop may perhaps be interesting from its novelty.

Italian rye-grass for a seed-crop requires to be cut before it becomes perfectly ripe, for if allowed to stand too long the greater portion of the seed will be blown out by the wind. When the seed is ripe—this may be known by examining the heads and seeing that the seed is perfectly formed—it is mown early in the morning, for when damp the seed does not shake out so much as it does in the heat of the middle part of the day. When the mowing is finished, should any docks or thistles, or any other large weeds be observed in the swath, they may be picked out by women and children; this will tend in some measure to secure a good and genuine sample of seed, the sowing of which will not produce a crop of weeds upon the land. The next day after mowing, as early in the morning as it can be conveniently done, the grass is tied up in sheaves in the same manner as wheat, and then placed four sheaves in a shock. By adopting the practice of tying, comparatively slight loss of seed is occasioned by the operation of getting together and carting. The straw must also be more valuable than when exposed to the full action of the sun and wind. The seed will be fit to thrash in a week or ten days from the time of cutting; but this of course depends upon the weather. It may also be carted sooner if thrashed in the field at once than it can be if stacked or carried in bulk to the barn; for if at all green this kind of grass is very likely to heat, and thus spoil the seed. A hot, dry, calm day ought to be selected for thrashing the seed in the field, and a smooth piece of ground may be selected for the thrashing-floor in the centre of the piece. Four or five thrashers may be kept at work by having a horse and a light cart with a cloth laid across it to prevent the shed seed being lost. A man and a boy carting with one horse will keep four or five thrashers at work.

The rye-grass straw may be stacked up immediately after thrashing, and, if it is not made too much, it will be pretty good hay.

The seed will require to be spread thinly over a floor and frequently turned with a shovel to prevent heating, and on hot days it must be laid on a rick-cloth in the sun: this will require to be repeated several times before it is fit to put away in sacks.

When seeds fail, which is often the case on the poor soils, the land is ploughed up and sown with peas. Occasionally the barley is not seeded, and then peas or tares are grown after the barley; the tares are either fed or seeded; if fed, followed by cole-seed also fed.

*4th Year, Wheat.*—The preparation for wheat is claying, dunging, or folding. Some apply the greater portion of their farm-yard dung to the root-crops, considering that, if a good root-crop is secured, it will be the means of laying a foundation for the succeeding crops. The process of claying will hereafter be described. The dung is usually carted out of the yards on to a bottom of mould or clay. After lying for some time it is turned over, the outside receiving a covering of earth. It is generally considered that the dung for wheat should be carted on clover land some time previous to the ploughing, so that the clover may grow through the coating of dung, as where manure has been ploughed in directly, the crop of wheat has been found to be inferior, but the reason it is difficult to imagine. The old layers are ploughed in September and October about 4 inches deep, with the furrows laid flat, and then rolled in the same direction as ploughed: the implement used for this purpose is usually the common drill-roll with three horses, or the common heavy roll. The time of sowing wheat is October and November, the quantity used about  $2\frac{1}{2}$  bushels per acre.\* Previous to drilling, the seed is prepared by steeping in a solution of blue vitriol; the following recipe is very generally used and found effective:—Dissolve a pound of blue vitriol in a pail of boiling water, then add three pails of cold water and it is fit for use. Let the wheat be in the liquor ten minutes, during which time it should be stirred and skimmed; then strain it off through a skep over another tub, and in twelve hours it is fit for use. The wheat thus prepared is drilled either in the direction the land is ploughed in or across the stetches, the land being harrowed before and after the drill. A drill drawn by three horses sows about 10 acres in a day. Artificial manure, such as rape-cake, is frequently drilled with the

\* A few farmers may use a smaller quantity of seed per acre, but the average of the light land would be nearly, if not quite,  $2\frac{1}{2}$  bushels. This quantity of seed may appear unnecessarily large; but it is required on the light soils, particularly where game is strictly preserved.

wheat, or sown before the plough when no farm-yard manure has been used. The plan of sowing the rape-cake before the plough is preferred to drilling it, because by the former method the manure is deposited further from the seed, it does not force the wheat early in the season, but in the spring when growth is desirable. The varieties of wheat chiefly cultivated are the Clovers Red, Marygold or Rattling Jack, and Spalding's Prolific—the latter is a very productive though rather coarse variety, which is very generally grown throughout the country, and owes its introduction to a labouring man named Spalding, who lived at Barningham in this county. Thirteen years ago Spalding, while thrashing in his master's (Mr. Wiseman's) barn found three or four particularly fine ears of wheat; these he had the foresight to pick out and plant in his garden; the next year he again sowed the produce, and the third year grew a quarter of an acre; he then sold his entire growth, which was sufficient to plant 10 acres—the produce of this was upwards of 8 quarters per acre. A small subscription was raised by the neighbouring farmers for Spalding; he died a few years since: there are still some of the family living at Barningham. Spalding has done as much for his country as many more public men; though unknown, he has had his *name* widely disseminated, though perhaps he did not reap any very great worldly benefit from his discovery.

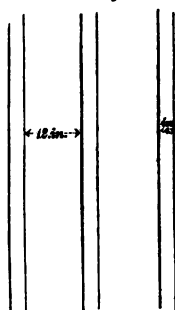
The Talavera wheat was largely grown a few years back with much success, but it has so deteriorated that it is not much cultivated at the present time.

The cultivation in the spring is that of light harrowing across the drills, usually obliquely, in the dry weather of March; this destroys the poppies and pulls up those weeds that cannot be cut with the hoe: the improved appearance of the wheat a few days after is very apparent. Soon after harrowing, the wheat is hand-hoed, and this hoeing repeated with weedings so late into the season as June, at a cost of 6s. per acre in all.

Some farmers use horse-hoes, with which they are able to hoe between drills only six inches apart. This consists of a wooden bar 8 feet long on wheels. The hoes, six in number, work on levers, not much unlike those of Garrett's horse-hoe, attached to this bar. The levers are separate, have universal joints, and handles to each. One man or boy steers two hoes, and a man leads the horse. The horse-hoe, in returning, hoes those drills where the hoers walked in the first bout. About six acres per day are hoed on 8-inch work. Rape-cake or nitrate of soda is sometimes used as a spring top-dressing.

Wide drilling with two rows close together is said to answer remarkably well on light land; by this plan wheat or peas are drilled in rows 4 inches apart, with a space of about 12 inches

intervening between every two rows—thus. Of this method much may be said in its praise and dispraise. Scientific men

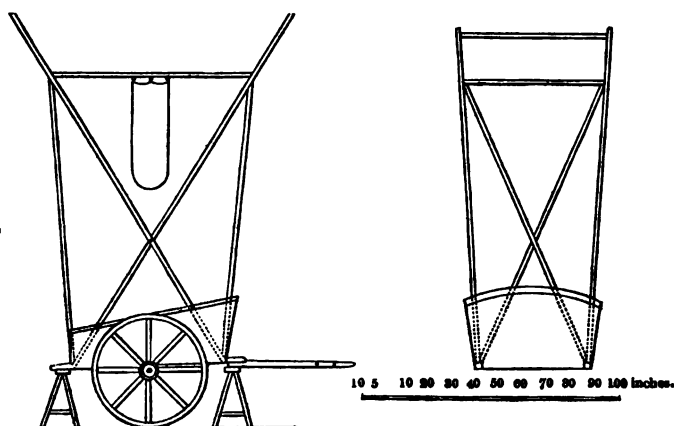


tell us that light and air are essential to the production of a fruitful crop. Practice will also tell us that wide drills are well suited for horse-hoeing and stirring the soil during the growth of the crop. But on the other hand, in the wide drills there is much more space and air for weeds to vegetate and grow. And it is found on these poor soils, so favourable to the growth of weeds and so unfavourable to the growth of corn, that, should wet weather occur during the hoeing season, it is impossible to eradicate the weeds.

Rye is grown on the very poor soils instead of wheat, a proportion of which is thrashed out during harvest, for which there is always a demand for the purpose of being sown for green food in the spring.

The practice of mowing wheat is on the increase; it is a practice that cannot be too much commended, particularly for harvesting the light-strawed crops of this district. The manner of putting out harvest-work adopted in the western sand district will be found described in the 'Essay on Piece-work,' vol. vii. p. 119 of the Society's Journal.

Stacking-stages are used by many farmers; one of the most convenient is a frame fitted into a cart, which admits of removal from one stack to another with great facility: the advantage of this stage is the convenience to the men unloading when the stack gets beyond a certain height; it also saves the shelled corn,



which either falls through holes into the cart or into a sack hung on hooks.

The frame is fitted into a cart in a short time, and when harvest is ended it is removed from the cart and laid up ready for another season.

Made of larch-poles the cost for materials and workmanship is under 3*l*.

*The management of manures* demands some attention. In the heavy-land district the term "muck and manner" signifies a compost formed of earth dug from borders, the scouring of ditches, and other soil, which have been removed to form a bottom for the farm-yard manure; where it can be conveniently obtained, chalk is used by some for this purpose. The manure is carted from the yards principally from Christmas to June, and either thrown from the carts on these heaps of soil, or the carts are drawn on the hill and unloaded by kicking up. By the first method fermentation commences immediately, the manure quickly becomes rotten, and there is consequently a great loss of bulk; by the latter very little heat arises, the pressure of the carts causing the manure to keep as free from change as if it was still trodden by the cattle in the yards. Two turnings are frequently given, by which the manure and heavy stuff become mixed; a portion of the earth is laid on the outside of the heap to prevent waste and the escape of gases. Manure fresh from the yards is used by some farmers for roots: those who object to this system say that unprepared dung does not so readily decompose in a stiff soil as it does in a light one.

Great loss of bulk is undoubtedly sustained by the method of preparing dung that is frequently adopted; and this loss, being occasioned by the escape of vapour and fluid, no doubt causes some loss in the fertilizing power of the manure. Compost, formed in the proportion of 10 loads of heavy stuff to 20 loads of dung, leaves from 20 to 25 loads when applied to the land; this is reckoned by some who do not manure for roots as a dressing for an acre of land for wheat. It is a question not yet agreed upon by the Suffolk farmers, whether the manure should be applied for green crops or for wheat; the latter on the heavy land is frequently too bulky a crop, and is consequently laid, and therefore one would imagine the manure is best for the green crop, which can never be too heavy. Manure throughout is chiefly manufactured in yards.

*Cattle* are generally bought in lean in the autumn, fed on white turnips, then swedes, and afterwards beet, with corn and cake or compound, and sold fat from February to June. Cattle are chiefly grazed in yards, the polled home-bred; and Galloway Scots are considered to be the best, from their quiet nature, for open yards, though short-horns are very often fatted. Though

loose throughout the day, the cattle are usually tied up to the trough while eating their bait of meal or oil-cake.

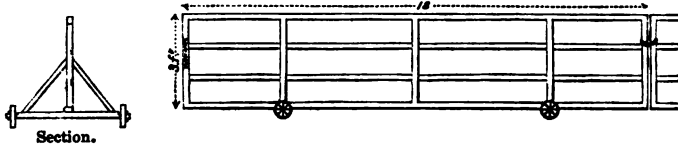
Mr. Edwards, of Wickham Skeith, as well as some other farmers, fats bullocks and hogs in the same yard—a small place being partitioned off for the hogs to go under and feed. The bullocks do not appear to be at all disturbed by the pigs, nor the pigs inconvenienced by the bullocks. This is perhaps one advantage that hornless breeds have over others for fattening in yards, for they are generally more peaceable among themselves and also with other animals. The advantages of having pigs kept with bullocks are that no loss of food is sustained, for they not only eat the food thrown down by the cattle, but also (particularly if the cattle are corn or cake fed) in a great measure consume that which has already passed through the cattle. It is thus exposed to the digestive organs of two distinct kinds of animals; and we may take it for granted that all the fat or flesh forming principles are by that means extracted. The routing of the pigs in the litter shortens the manure, and they also increase its value by the mixture of different excrements.

*Farm Horses.*—The manner of stabling horses is very different from that of other parts of the country; the horses are merely baited in the stables with oats or beans (crushed) mixed with wheat and barley chaff or cut hay, and in the night are turned out into yards to which a good open shed is attached—in this are troughs and racks filled in winter with hay or fresh barley-straw. In summer the system is that of soiling in the yards, principally with tares, though lucerne, clover, Italian rye-grass, and common meadow-grass are also given. Some are still in the habit of turning their horses out to collect their own food; the disadvantage of the latter plan is obvious enough—it occasions a waste of food, and a horse does not require exercise after a hard day's work. Much may be said on both sides in favour of yard or stable management; however, the Suffolk horses turned out into yards throughout the year are not exposed to extremes of heat and cold, seldom suffer from grease, and are I believe more free from disease than those kept entirely in stables.

*Sheep.*—The greater part of the heavy land of Suffolk is not suited to folding sheep, though fattening and breeding sheep are kept by some farmers. Earth-drains are liable to be injured in the common method of hurdling by the shepherd striking his fold-drift into the drains; consequently hurdles on wheels or feet, either of wood or iron, are used by many: these appear equally adapted for light-land folding.

Mr. Harvey Denny, of Mendham, Suffolk, has had a fold of this description in use for fourteen years, and the hurdles are now in very good repair. Mr. Denny's hurdles, of which I have

given a sketch, are 18 and 21 feet long, on four iron wheels; the axles of the wheels are one yard long. If the wheels were closer, the hurdles would blow over.



An 18-foot hurdle is made from a 21-foot deal, costing 10s. 6d., four wheels 3s., making altogether something less than 20s. for each hurdle. The fold is set in a quarter of an hour by a boy; or if on a fallow where the soil is loose, a horse is hung on and draws one side of the fold at once. Mr. Denny says the advantages of these hurdles over those commonly used are their durability, their little trouble in removal, particularly on hard land; they are not so liable to blow down, which common hurdles frequently do on light hilly land similar to his farm. Strongly as he recommends these, yet he would prefer iron hurdles on wheels: these are used by farmers in the neighbourhood of Mendham: some are made with iron rods between the top and bottom rails.

On asking the cost of hurdles of this description in the neighbourhood of Stowmarket I was told 16s. each; these were made of larch poles sawn in two, 20 feet in length, with four iron wheels.

Breeding sheep are chiefly a cross between the Down and old Norfolk. Grazing sheep—half-bred Leicesters are preferred—are bought in the autumn, and sold fat from March to June.

Some farmers throughout the winter feed their sheep during the day on pasture-land, carting turnips for them from arable land, and in the night drive them into a yard; by this management the injury done by treading the land is prevented, and a good yard of manure accumulates during the winter months.

Farmers who feed their sheep on pastures and then drive them to fold on arable land are often of opinion that grass-land is injured by sheep.

I find it is the opinion of a good practical farmer who folds on grass-land that he has greatly improved his heavy-land pastures by that means. As affording a valuable supply of spring food the following practice may be worth mentioning, and it is not the worse for being an old system strongly recommended by A. Young. A portion of the pastures are not fed in the autumn, or the after-math, after the hay has been made, is shut up through the winter;



this is folded off in the spring with ewes and lambs, the lambs being allowed access to the fresh grass at the head of the fold. Tares afford feed during the early part of summer to some flocks.

A considerable portion of pasture-land has of late been converted into arable, the manner of breaking up is by paring (breast-ploughing) and burning in the spring at a cost of from 25s. to 30s. per acre. The flags are burnt in small heaps and the ashes are spread on the land; some, to save fuel, burn in one or two large heaps. Coleworts, white turnips, or swedes are taken the first year, then oats, and (by some) wheat the third year, which cannot be good management, though some take peas the third year and then wheat, and then the usual rotation. The land is drained the first or second year after breaking up if it requires it. Clay or heavy stuff is laid on new land, but this will be described under the head of marling.

Nothing of any moment has been said concerning pasture, nor do I think that the subject demands that much should be said. Under our present system of managing grass-land and the increasing labouring population, I question whether there is any great quantity (with the exception of marsh) that would not be better broken up. A certain proportion of grass-land is undoubtedly required on every farm where stock is kept, but speaking generally of Suffolk it ought to be a small proportion.

Among the notes which were taken in my journey round the county the following are the only ones relating to grass-land worth mentioning. With respect to low-lying meadows one farmer says he has made great improvement in the quality of the grass by carting on road-scrapings, after the application of which the rushes and sedges disappeared. Thistles abound on a good deal of the grass-land, and attempts are made to extirpate them by mowing off when grown to some height. Mr. Bond, of Hacheston, says they may be destroyed in three or four years by spudding up when young.

### 3. *The Improvements effected in the Farming of Suffolk since the Report of Arthur Young in 1804.*

I am indebted for the following description of the improvements since the time of Arthur Young, to Mr. Rodwell, of Alderton Hall,—a gentleman whose well-known experience gives the greater weight to the excellent remarks he has made on the subject:—

*“Improvements in the Farming of Suffolk since the Report of Arthur Young.*

“To our greatly revered countryman we must give the well-deserved

and well-earned fame that has ever attached to his habits of industry, perseverance, and foresight, his first object amidst his inquiries being to induce farmers to lay aside their deep-rooted prejudices, and thus, as he has often expressed it to me, 'to make the farmers *think* for themselves;' and that he accomplished this to a great extent the improvements that have gone on progressively since his time are indisputable evidence; but to make any deductions as to the exact measure of such a result could be effected only by collecting the statistics of corn and cattle annually produced in our county now as compared with what it was in the last century, and the comparative cost of such production. This, however, is not an easy task; but a fair test might be taken from the advance of rents, which, of course, must be some index, as they can only be raised by an increase of production at a diminution of expense. This, therefore, would give a *result of 100 per cent.* upon the average of this county.

"If, however, we take our data on the above head by the systems pursued by the present race of farmers in the details of management, it would lead us into a wide field—too wide, I fear, for the object of your inquiry. There is, however, one subject which I think demands our especial remark, which is the greater care and improved management of manures, not only by enlarging the quantity by the increase of stall-feeding cattle and various other plans, but in the better application of it when obtained.

"We have also a fresh stimulus in draining, and in the more frequent use of clay, chalk, &c., as top-dressing on soils to which they are adapted; but they are to be mentioned rather as a continuation of systems adopted formerly than of modern introduction.

"Then we have also great improvements made in the introduction of new roots for general purposes, and amongst them we may rank the Belgian carrot. Then also of seeds, grasses, &c.; and in this class we must not omit to notice the greatly increased production from the growth of Italian rye-grass (*Lolium Italicum*), under which head one of the most intelligent agriculturists in the county of Nottingham, Mr. Parkinson, says by the introduction of Italian rye-grass he doubled the quantity of cattle on the same occupation, both in rearing and summer fatting.

"To enumerate all the improvements and aids given to our pursuit by the science and perseverance of the justly renowned machine-makers of this county would be a work of supererogation, for the names of Ransome, Garrett, Smith, &c., are already too well known to need any comment. It would, however, be only giving a just tribute to the long established fame of the Leiston Iron Works if we were to acknowledge the debt which our county owes to its firm for having brought to an unrivalled perfection its *drills*, its *horse-hoes*, and more especially its threshing-machines, as their prizes will amply testify, not only at the meetings of our National Society, but throughout the provinces."

In addition to the important improvements alluded to by Mr. Rodwell we may mention the superior cultivation of mangold-wurzel (this root is not mentioned in the report of Arthur Young,

and therefore we may conclude it was very little if at all cultivated) and other root-crops.

*The Improvement in the Breed of Horses, Sheep, and Cattle.*—Suffolk has long stood pre-eminent for its breed of horses, and the unvaried success it has had in carrying off the prizes at the Society's shows sufficiently proves that the Suffolk horses have not deteriorated in their value as the *best* for agricultural purposes. At five out of the eight meetings which the Society has held, viz. at Oxford, Liverpool, Southampton, Shrewsbury, and Newcastle, the Suffolk cart-stallions have won the first premiums. At the Cambridge meeting a Suffolk cart-mare and foal, and a horse, bred by a Suffolk farmer, *won the first prizes*. At the Derby and Bristol meetings I believe none of the Suffolk breed were exhibited. The fact of Suffolk beating all England for six years out of eight must convince the public, if that were now needed, of the invaluable properties of the Suffolk Cart-Horse.

Suffolk cows, so noted for their milking properties, are still the most general dairy-breed in the county; but the Suffolk farmers wisely depend on other counties for cattle for grazing purposes, and it may be truly said that the Suffolk farmers of the present day are better feeders than breeders of cattle. But it is in the breed of sheep that the greatest improvement has taken place. The restless Norfolk is now rarely seen, their place being taken by the Southdown, or by the cross between that breed and the old Norfolk—a breed equally hardy, with greater fattening properties than the old Norfolk, though not in the latter respect equal to the first cross between the Leicester and Down, which cross in Norfolk and Suffolk is the favourite for grazing. If we except Mr. Jonas Webb's incomparable flock, some of the Southdown sheep bred in Suffolk will challenge competition with the best in the kingdom.

Great improvement has been made by converting pasture into arable land by the bringing into tillage a considerable extent of heath-land, on much of which good crops are now grown; by the use of artificial manures; and, in a word, the general management of all descriptions of land may be considered as greatly improved.

#### 4. *The Antiquity and Extent of Thorough-Draining within the County.*

Evidence has already been collected on the antiquity of draining in this part of the country, which leaves but little to be said concerning it, and reference to works already published, more particularly to the article of the Rev. Copinger Hill, of Buxhall, in the Society's Journal, will give ample information both as to the antiquity and extent of thorough-draining. That the practice

of draining can be traced to the early part of the seventeenth century is a fact well authenticated by many writers on the subject.

Much of the heavy land of Suffolk has been repeatedly drained, though, from inquiries which have been made in various parts of the county, the system of close-draining has never been carried to a *greater* extent than it is at the present time; that it has been progressively on the increase is shown by the statements of old farmers, who allege that sixty or seventy years ago the practice was just being introduced into the parish in which they had been brought up, and that previous to that time the system of *thorough* draining by placing drains at regular and close intervals throughout a whole field was not practised, but merely drains put in here and there to carry the water from a particular wet spot.

The extent to which draining is carried is well authenticated by the statement that *throughout* the entire heavy land of Suffolk there are *very few* arable fields in which drains are not to be found.

The following list of the quantity of draining done by the successful competitors for the prize of 4*l.* offered by the West Suffolk Agricultural Society, will be a proof of the extent to which draining has been carried by the modern race of tenant-farmers. I have to thank Mr. Beeton, the secretary, for this information.

The conditions for competition for this prize are—

“To the tenant who shall have spade-drained within the last twelve months the greatest number of rods in a husbandlike manner, relative to the extent of his occupation.”

These conditions were altered in 1838.

To the tenant who shall have expended the largest sum in spade-draining within the last twelve months relative to the extent of *wet land* in his occupation:—

|   | Rods. | Occupation | Acres. |
|---|-------|------------|--------|
| 1833. Mr. John Rollinson, of Rede, drained    | 4000  |            | 150    |
| 1835. — George Doel . . . . .                 | 7520  | ”          | 150    |
| 1836. — James Lee, Whepstead . . . . .        | 6435  | ”          | 300    |
| 1837. — James Lee . . . . .                   | 4059  |            |        |
| 1838. — John Simpson, Wyken Hall . . . . .    | 5858  | (Wet land) | 275    |
| 1839. — John Boldero, Rattlesden . . . . .    | 7039½ | ”          | 330    |
| 1840. — John Boldero . . . . .                | 7010  | ”          | 330    |
| 1841. — John Simpson, Wyken Hall . . . . .    | 5125  | ”          | 275    |
| 1842. — R. B. Harvey, <i>Norfolk</i> .        |       |            |        |
| 1843. — James King, Felsham . . . . .         | 4016  | ”          | 150    |
| 1844. — J. S. Flowerden, Hinderclay . . . . . | 7105  | (Wet land) | 120    |
| 1846. — H. Lugar, Hengrave . . . . .          | 2415  | (Wet land) | 150    |

I have also to thank Mr. Manning Keer, the Secretary of the East Suffolk Agricultural Association, for a list of the successful competitors for the draining prize to the tenant who should drain

the most during the last twelve months without any assistance from his landlord.

|   | Rods.  | Occupation.<br>Acres. |
|---|--------|-----------------------|
| 1840. Mr. Robert Foulsham . . . . .         | 7243   | 235                   |
| 1841. — Francis Skoulding, of Kelsale . . . | 8689   | 270                   |
| 1842. — Francis Skoulding, of Kelsale . . . | 6725   | 270                   |
| 1843. — Francis Skoulding, of Kelsale . . . | 4805   | 270                   |
| 1844. — Samuel C. Goodwyn, of Huntingfield  | 6064   | 334                   |
| 1845. — Charles Smith, of Sweffling . . .   | 1149   | 342                   |
| 1846. — George Edwards, of Monk Soham       | 11,395 | 290                   |
| 1847. — Henry Moore, of Badingham . . .     | 9075   | 279                   |

I extract the following note from Sir John Cullum's 'History of Hawstead, in Suffolk' (1780) :—

"The greatest improvement of which this strong soil is capable is draining. The drains cut with curious tools made on purpose are about two feet deep, wedge-shaped, and fitted at bottom with bushes, and over them with haulm. Six or seven score rods are cut upon an acre at a cost for cutting of 2*d.* a rod."

"The difficulty of discovering the antiquity of thorough-draining arises from its being by old writers confounded with spring drainage. This latter was practised even by the Romans with drains 3 feet broad at top, 4 feet deep, and 1½ foot wide at bottom, filled half full of stones, or the bottom was made narrow and a rope of twigs fitted to it." —*London Ency. Agricult.*, 1831, p. 27.

To return to Suffolk thorough-draining. In the Suffolk Report it is said that Mr. Makyns, of this county, was about twenty years ago (1770) rewarded by the Society of Arts for a plough for cutting these drains, but that it had been laid aside as more expensive than hand-labour. James Young, Esq., of Clare, also describes the method then common in that vicinity, which was exactly the same as that still practised. He mentions a field drained in 1773 which had every drain in the field (except one) running in April, 1786. He drained 30 inches deep, using the plough for the first 14 inches to 20 inches; put eight score rods on an acre, and paid for digging only 1*s.* 8*d.* per score rods, for filling with stubble 4*d.* per score rods.

The following extracts from a book printed 120 years ago, styled 'A complete Body of Husbandry, collected from the Practice and Experience of the most considerable Farmers in Britain; particularly setting forth the various Ways of improving Land by *hollow-ditching, draining,* &c., by R. Bradley, Professor of Botany in the University of Cambridge, F.R.S., 1727, will be additional evidence as to the antiquity of thorough-draining in Suffolk. Professor Bradley mentions hollow-ditching or draining as lately invented, and introduced to the North of Essex; and therefore we may take it for granted the same system of draining was adopted at that time on the adjoining wet land of Suffolk. It would take up a considerable space to extract the whole of Bradley's description of *hollow-ditching*, though I shall give sufficient to show that the system then adopted resembles the present practice, the latter being an improvement on the old method of draining :—

"These drains, whether they be the great or small ones, must be made two full spits of a spade deep and half a spit, sloping on each side from near three feet wide at the top to about half a foot at the bottom, and then some large rough stones or cows' horns\* laid at the bottom for the water to run through, with some straw over them; or else a few boughs of elm, white-thorn, or hawthorn rammed into the bottom, and straw laid over them, and then covered with the earth that was dug out. When all are completed and settled, then you may plough the piece and dispose it equally on such a level as it will bear. This method is accounted the best and cheapest way of hollow-ditching or draining, and will make the wettest squally land fit to bring very good corn, or to be laid down for grass, or other uses. The common price for digging and laying the stones or bushes and filling up the drains is about two-pence halfpenny or three-pence a rod in length, but the owner or possessor of the ground must find bushes and straw, which, together with the digging and laying, will amount to about sixpence a rod. A large field, I confess, will amount to some money, as suppose there may be required one thousand rods of this work to drain twenty acres, the expense at sixpence per rod will be twenty-five pounds, or after the rate of one pound five shillings for the improvement of each acre, which is but a trifle considering that the ground before was neither good for bearing corn or grass, and will now bring good crops of any kind. This improvement is chiefly practised in Essex; I have seen it at Navestock, in the forest, at an estate belonging to Aaron Harrington, Esq., and is lately brought from that part of the county to the north of Essex about Wicken-Benant,† and near Sir Kane James's; and I doubt not but will be generally used upon all the squally wet grounds in England when it comes to be known, for it is *but a late invention*: only it is to be noted that the ground should lie sloping or declining one way or other to be mended by this means."

The prediction of Mr. Bradley that this improvement of wet land would become general shows that his work on husbandry was not much read by the farmers of the eighteenth century; for if they had been of more studious habits they would, on trial of the practice, long ere this have seen the benefits of (what is generally considered to be the modern invention of) thorough-draining. That the system of which Bradley speaks is a thorough-draining system is proved by his mentioning the number of rods required on a given space, viz. 1000 rods on 20 acres, which being 50 rods to the acre will make the drains about three times the distance apart that they are at present in the eastern counties.

The term *thorough-draining* is perhaps derived from the old word "thorow," which Bradley mentions as "a distinguishing character for a trench cut purposely for carrying off of water."

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\* Mr. Hill in his article on Suffolk Draining (Journal, vol. iv. p. 31), mentions instances of old drains being found filled with bullocks' horns.

† Wicken-Benant or Bonhunt is a village in the north-west corner of Essex, 3½ miles from the borders of Herts, 5½ from those of Cambridgeshire, 11 from those of Suffolk, and 15 from Great Thurlow, Suffolk, where Mr. Jonas has shown thorough-draining to have been practised more than a century.

*5. The process of Marling and the Soils benefited thereby.*

The details of this very interesting and desirable practice in the husbandry of Suffolk have been described by many writers, among whom are the late Mr. Macro of Barrow, in the 'Annals of Agriculture,' and 'The Letter of Mr. Josiah Rodwell of Livermere to the Board of Agriculture,' in 1800, for which he was awarded their Gold Medal. This letter is to be found in the Report of their Proceedings, and in the 'Annals and Calendar' of Arthur Young.

By the process of marling I believe is to be understood what we in Suffolk denominate claying, and perhaps improperly so, for there is very little clay applied to the land that does not contain a large proportion of lime; and the general test as to the good quality of clay is the presence of small particles of chalk, or chalk-stones as they are here termed. Notwithstanding this, I have used the term claying, because it is so called in this county, and in order that I may not be misunderstood: but it must not be taken for granted that I mean real clay, but a mixture of clay and chalk, which ought properly to be termed marl.

The application of marl or clay may be said to be general both on heavy and light land. On heavy it is used on freshly broken-up pasture-land, and mixed with farm-yard manure in the formation of compost heaps. On light soils its application is of course more extended, as it is here that the great benefits are derived by the improvement in the mechanical texture of the soil.

The scouring of ditches on the heavy soil is carted to form bottoms for the farm-yard manure, with which it is mixed by turning, &c.

On freshly broken-up land, clay and other soil is carted on to the amount of from 40 to 50 cubic yards per acre. The benefit derived from this is the better quality of the grain, and regularity of the crop. New land, whether it is naturally of an adhesive and retentive nature, or dry and sandy, or light and loose peaty soil, is found to produce a patchy crop of a bad quality of grain, which is corrected in a great measure by the application of marly clay. The excess of organic matter in the heavy soil gives it a looseness of texture which the clay corrects: the dry and loose texture of the sand is rendered more adhesive and retentive of moisture, and the peat is benefited by consolidation, and the supply of inorganic matter.

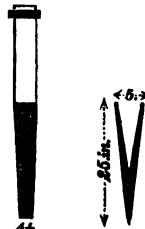
In first beginning to marl or clay a field, if no pits have been begun beforehand, it is usual to ascertain where the best material can be most conveniently raised for carting. This is done by digging down to ascertain the subsoil, and frequently the marly clay is found within a foot of the surface. The soil is now

dug and filled into carts; the digging proceeds in a sloping direction downwards, so as to form a mouth to the pit of a gradual descent, for if very steep the horses are liable to be strained in drawing the loaded carts from the pit. As soon as a sufficient depth is obtained the plan of operations is altered; for instead of picking and digging they now proceed to make what are termed "falls," in a manner that is well known to all excavators: this is done by picking or undermining at the bottom for a sufficient distance along the side, and at the extremities of the undermined part, a perpendicular crevice is picked out from the top to the bottom. This having been completed, clay wedges shod with iron are driven in at top with a heavy mallet or beetle, and this being continued for a short time the clay splits down perpendicularly. In this manner as much soil is "raised" as will be filled into carts by three men in a day's work. Men employed in filling usually "raise" (if falling down may be called raising) the clay when the horses are resting, or after they have left off for the day.



Fig. 1. Clay beetle, with iron hoops  $1\frac{1}{4}$  inch diameter put on with nails; made of tough elm; the handle of ash. This is a clumsy and heavy tool, but not more so than is required to drive the wedges.

Fig. 2. Clay wedge, 45 inches long, 5 inches diameter at top, with  $1\frac{1}{2}$ -inch iron ring round it. Iron part of wedge (shaded in the drawing) riveted through the wood.



The labour of filling clay is generally paid for by the cubic yard or load: for filling and spreading from  $2\frac{1}{2}d.$  to  $3d.$  per yard is paid. The work is sometimes done by men who contract at so much a yard (measuring the pit when the work is done) for filling, spreading, and carting, finding carts and horses: the price is about  $7d.$  per yard if carted one furlong,  $1d.$  being added for every additional furlong, but this has been already described in the report on Measure Work. Ten yards a-day is reckoned a fair day's work for one man.

The season generally chosen for carting is during the winter on fallows, and occasionally on layers; clay is carted at any period of the year for bottoms of manure heaps.

Carting clay or marl is an operation that will afford ample employment during the frost of winter, and it can then be done with the least injury to the land. When carted in the winter, it is exposed to the frost, by the action of which the hardest clods are broken. Spreading should be done as soon as possible after carting, because in the event of wet weather this becomes a trouble-



some operation from the clay sticking to the shovel, and also from its becoming consolidated in the heaps.

After being spread, the stones, of which there are often a great many, are picked from the land, and the clay pulverized during dry weather by harrowings and rollings. Some employ people to break the clods by manual labour; but this can be done much more effectually by Crosskill's clod-roller.

The clay is ploughed in shallow; the next ploughing deeper, so as to bring it again nearly to the surface. Many prefer claying on clover layers; and when it is dry weather there is no better time for laying on clay than during the few weeks preceding harvest. It is then dry, and can easily be pulverized, and the furrow for wheat is always a shallow one; the clay is well mixed up with the soil by the deeper fallow ploughings.

The quantity usually laid on per acre is from 30 to 40 cubic yards; though a much greater quantity is frequently applied to fresh broken-up heath lands.

To show the extent to which the admixture of the subsoil with the surface is carried by the tenant farmers of this county, I give the following list of the successful candidates for the premium of 4*l.*, offered by the West Suffolk Agricultural Association, with the number of chaldron loads (36 bushels) spread by each farmer, with the extent of his light or fen-land occupation. For this information I am indebted to Mr. George Beeton, the Secretary.

The conditions of competition for this prize are—"A premium of 4*l.* to the tenant who shall have carried and spread the greatest number of chaldron loads of clay, loam, or marsh-earth, within the last twelve months, according to the relative proportion of arable land in his occupation." During the latter meetings this rule has been altered to the relative proportions of light land in the tenants' occupation.

|  | Loads. | Occupation | Acres. |
|--|--------|------------|--------|
| 1834. Mr. John Rollinson, of Rede, clayed with | 1245   |            | 150    |
| 1835. — James Lee, Whepstead . . .             | 1679   | "          | 300    |
| 1836. — James Lee . . .                        | 1145   | "          | 300    |
| 1837. — James Lee . . .                        | 1512   | "          | 300    |
| 1838. — George Gayford, Rymer . . .            | 2556   | "          | 500    |
| 1839. — George Gayford . . .                   | 8485   | (Fen land) | 160    |
| 1840. — John Boldero . . .                     | 1730   | "          | 330    |
| 1841. — Edward Witt, Fornham . . .             | 6776   | (Fen land) | 215    |
| 1842. — Edward Witt . . .                      | 10,286 | (Fen land) | 215    |
| 1843. — Edward Witt . . .                      | 14,590 | (Fen land) | 215    |
| 1844. — George Gayford . . .                   | 4513   | "          | 500    |
| — Edward Witt . . .                            | 8876   | (Fen land) | 215    |
| 1845. — Edward Witt . . .                      | 9325   | (Fen land) | 215    |
| 1846. — James King, Felham . . .               | 1066   | "          | 150    |

For a prize of the same amount offered to tenant farmers only, by the East Suffolk Agricultural Association, we have—

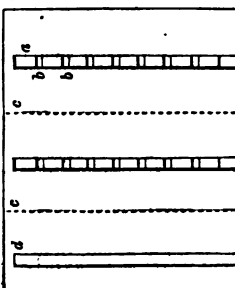
|                                      |      | Loads.     | Acres. |
|--------------------------------------|------|------------|--------|
| 1841. Stephen Oxborough, Capel . . . | 3540 | Occupation | 1600   |
| 1842. Thomas Freeman, Henham . . .   | 1542 | „          | 400    |

In the fen district clay is used to a large extent, and with considerable benefit: it consolidates the loose peaty soil, by supplying inorganic matter to the vegetable material of the peat, and consequently it produces grain of a better quality and stiffer straw, the clay is dug in holes or trenches, and is not such expensive work as claying light sandy land, where the clay has to be carted to a considerable distance.

Mr. E. Witt, of Fornham, whose name appears so frequently in this list of successful candidates for the prize of claying, has favoured me with an account of his method of claying on his farm in burnt fen, by which plan, during the six years he has held the farm he has dug and spread 51,798 loads (of 24 bushels) on 183 acres of arable land, at an expense, the whole being manual labour, of 463*l.* 6*s.* 9½*d.*; besides having levelled hills by carting and barrowing, and carted ditch stuff on the same land to the estimated quantity of nearly as much more. Very few instances of the admixture of the subsoil with the surface in so short a time will be found to equal this; by this means he has completely altered the nature and appearance of the soil, has given employment to a great many labourers, and made a permanent improvement for which he will be amply recompensed by the increased quantity and quality of grain grown. The fields being full of hills and holes produced irregular crops; but by removing the hills, and carting them on the black peat of the low parts, the surface has been levelled, and the fields now produce even crops.

The manner of claying is as follows:—

Two furrows (*d*) are opened across the field, at intervals of two rods asunder; a man begins at one end of these and digs a hole (*a*) about 3 feet wide by 6 feet long; when he reaches the clay he does not dig down perpendicularly, but undermines a little, and throws out two loads of clay (24 bushels each), one on each side of the hole; he then digs holes similar to the first all the way up the furrow, leaving a



narrow space (*b b*) between each to stop the water from running into the hole he is digging, as well as prevent the sides falling in.

The peat dug from each hole being thrown into the preceding one, he thus partly fills up the holes as he proceeds. The clay, being thrown out on each side of the hole, is spread up to a mark made with the foot across the field, midway between each row of

heaps, as at "c." The peat varies in depth from 2 to 8 feet; the cost for digging and throwing out is about 3*d.* or 4*d.* per hole; or if the peat is very deep, from 6*d.* to 8*d.*; the cost of spreading 10*d.* per score holes.

To complete the process of filling up the trench, a deep furrow is ploughed in on each side, the horses going at length. After the land has been ploughed once or twice across the trenches it becomes perfectly level.

Fen land works much better after being clayed, as the soil does not adhere to the plough. The land should be clean before it is clayed, as that operation is more difficult to perform afterwards; besides, the more the land is stirred the more rapidly will the clay sink into the subsoil.

The following is a list of the number of loads dug and spread by this method on Mr. Witt's fen farm since 1841:—

| Fields.            | Loads. | Per Acre. | Total Cost. |
|--------------------|--------|-----------|-------------|
| 13 acres . . .     | 3,372  | £2 12 9   | £34 6 0     |
| 14 " . . .         | 3,430  | 3 12 0    | 50 8 2½     |
| 15 " . . .         | 3,990  | 2 15 1½   | 41 6 8½     |
| 11 " . . .         | 3,082  | 2 6 10½   | 25 13 8     |
| 6 & 14 " . . .     | 480    | . . .     | 4 4 9       |
| 21 " . . .         | 7,622  | 3 18 9    | 81 14 2     |
| 10 " . . .         | 2,962  | 2 6 2     | 23 1 8      |
| 8 " . . .          | 2,198  | 2 0 0     | 16 0 6½     |
|                    | 200    | . . .     | 1 9 8       |
| 4 " . . .          | 1,200  | 2 9 6     | 9 17 6      |
| 22 " . . .         | 6,718  | 2 16 10   | 62 9 5½     |
|                    | 256    | . . .     | 2 8 0       |
| 6 " . . .          | 970    | 1 5 4     | 8 12 4½     |
|                    | 134    | . . .     | 0 16 9      |
| 1½ " . . .         | 370    | 0 16 0    | 4 0 0       |
| 10 " . . .         | 3,172  | 4 0 0     | 40 0 0      |
| Hills carried away | 5,140  |           |             |
| 4 " bank (strip)   | 1,286  | 2 10 0    | 10 0 0      |
| 17 " wash . . .    | 4,452  | 2 10 0    | 42 10 0     |
| 3 " . . .          | 764    | . . .     | 6 7 4       |
| 183 0 13           | 51,798 | . . .     | £463 6 9½   |

This averages 283 loads per acre, at a cost of 2*l.* 10*s.* 7*d.* per acre.

*Crag*.—A sandy mixture; calcareous from the quantity of shells it contains,—found in most of the parishes extending from Dunwich to the Orwell; it has been used as a manure to a considerable extent.

According to "Kirby," Mr. E. Edwards, a farmer of Levington, in 1718, accidentally discovered the use of this crag or shell. Being short of dung, he carried several loads of crag, and spread it over a part of a field, which to his surprise yielded a much

better crop than those parts which he had covered with dung. The origin of its being used on the black heaths is pointed out by Captain Alexander, in his "*Soils of East Suffolk*," and thence copied in the *Journal*, vol. iii. p. 183.

Of the use of crag as a manure, Mr. Rodwell says:—"The dimensions and great antiquity of the crag pits of East Suffolk, afford an indisputable proof of crag having been long used in these districts, and of its fertilizing properties, but more especially in rendering the stiff and retentive soils more friable and porous to the influence of atmospheric air. Upon these soils we find large quantities are usually carried, and in some cases repeated again and again with very good effect, at the rate of 30 or 40 cubic yards to the acre."

6. *The process of burning Clay, and the soils to which it is applicable.*

The practice of burning the soil dug from the borders of fields is very general in the heavy land of Suffolk: borders round the fallows are usually dug up in March, and the flags placed on their ends to dry. The scourings of ditches are burnt by some; these are either dug or ploughed up, so that they become dry; and are carted to the fire as wanted, or laid in heaps round the fire. The fire is prepared with straw, 3 or 4 faggots and blocks of wood, round which a wall of flags is formed; some mould is laid on, and the fire is lighted on the windward side; the flags are chopped in pieces before being laid on. Very little is laid on at first; but after a few days the heap requires constant attendance, because, if suffered to burn through, the fire is likely to go out; fresh clay must therefore be laid on 3 or 4 times a-day. Before letting out the fire the side walls are drawn and the unburnt flags are cut in pieces and burnt. The great art consists in applying fresh material as soon as the fire makes its appearance on the outside.

The cost for labour is from 8*d.* to 1*s.* per chaldron load (36 bushels); the burnt earth is used on fallows at the rate of from 15 to 30 loads per acre. It is also drilled with turnips, and a dressing of burnt earth is considered by some to be the best manure for clover. Border-burning being practised throughout the greater part of the heavy land district is a sufficient proof of its usefulness on that kind of soil.

But there is another system of burning practised, more especially in that part of the county lying between Stradbroke and Framlingham, viz., in Dennington, Worlingworth, Brundish, Badtingham, Laxfield, Cratfield, and the adjoining parishes. This is chiefly a deep staple soil. I obtained the following information at Stradbroke respecting "clod-burning," which is the name

given to this kind of burning. After the first thwarting of the fallow (cross-ploughing), and as soon as the land is dry, the clods are worked by harrowings and rollings into about the size of a hen's egg; these clods are raked into rows, and the accompanying drawing shows a fork which is used to gather the small clods into heaps ready for burning: the advantage of so many tines is, that the fork takes all the clods and leaves the dust. The tines are 1 inch wide, with  $\frac{1}{2}$  inch interstices.



The clods are burnt in small heaps, with haulm and bean-stalks, or furze brought from a distance. The burnt earth is then spread on the land and thwarted in (that is ploughed across the direction in which the land is ploughed when laid up in stetches for sowing). The cost for labour in burning about 50 chaldron loads per acre is 10s. With this dressing of burnt earth, it is asserted that better turnips are grown than with the usual dressing of mixed manure, and that they are always certain of a good crop of barley after burning: the soil is a strong loam.

The following information respecting clod-burning was obtained from Mr. Cluttern, of Tannington, a farmer in the neighbourhood of Framlingham. He states that clod-burning has been practised from 15 to 16 years; the present price of raking clods and for burning is from 7s. to 8s. per acre, and a man will burn nearly half an acre in a day; 2s. per acre is paid for spreading the ashes. The quantity burnt per acre about 35 three quarter loads (27 bushels): and he considers that this dressing of burnt earth is *equal* in effect to *any coat* of muck.

It takes 1 waggon load of "haulm" (stubble) to burn  $1\frac{1}{2}$  acre; 1 load of furze will burn  $2\frac{1}{2}$  acres, and 1 load of bean-stalks 2 acres.

In burning it is necessary to clear away the loose soil from the bottom of the heap before the fire is lighted, and of course to light on the windward side. The fires are made about a rod apart, and from 5 to 6 bushels is burnt in each heap. The quantity done of this description of burning depends upon the weather, though many farmers burn their fallows every 4 years. The following crops were obtained from a single coat of burnt earth, which shows its effect on this kind of soil:—

1st year. Fallow, clods burnt for turnips, but too late for roots.

2nd year. Barley, 7 quarters per acre.

3rd year. Peas.

4th year. Wheat, 6 quarters 1 pk. per acre.

5th year. Barley.

Burnt earth is considered by many farmers as the best preparation for turnips; and it certainly makes the adhesive soil work

better, and perhaps reduces some of the insoluble parts of the soil. Many farmers imagine that burning wastes the soil; but it only reduces the organic portion, which is again supplied by the application of farmyard manure. If by burning we are enabled to produce a good root crop on a stiff retentive soil, there is no fear but that the organic matter that has been consumed will be returned to the soil by the turnip crop, and the manure which arises from its consumption.

A great objection to the system is the quantity of stubble and other fuel consumed which might be converted into manure; and there is one injury likely to result from the practice, viz., that it may lead farmers into a bad system of cropping—however there is no reason why this should be the case. The instance which I have already given is not the only one; for some, I believe, have begun the practice of burning the barley and wheat stubbles, and then planting *wheat*. There are of course no covenants in such cases as these.

Paring and burning grass land has already been mentioned.

Clay dug from pits, and the surface soil of arable fields, is occasionally burnt in large heaps, in a manner resembling the practice of burning borders. Though burnt earth is of so much benefit in heavy land, yet on light land unburnt clay has been proved to produce better effects than when burnt.

*7. The improvements still required in the County generally: as to the higher cultivation of existing farms, the reclamation of waste lands, and the condition of the Agricultural Labourer.*

In Suffolk, as well as in many other parts of the country, farmers are frequently bound by covenants for the cultivation of their land under a certain rotation, without sufficiently considering that one rotation or system is not suited to every description of soil; or that more than one kind of soil occurs on the same farm. That it is an error to imagine the 4-course or any other rotation is the best that can be adopted, we may mention the opinion of Mr. Pusey, who says, "The merits of the 4-course system are great; but a great defect too is its monotonous circle of wheat, turnips, barley, and clover." Hence, whatever crops are introduced so as to remove to a greater distance the repetition of this monotonous circle, without breaking the arrangement of growing a corn and green crop alternately, is found to be an improvement. The farmer is often obliged to adopt the same course of cropping on a stiff clay as on a friable sand, although there are many unavoidable circumstances which render it impracticable always to farm in the manner laid down, with the same profit that might be obtained should some of these stringent conditions be taken off the farmer's shoulders. For instance, by being bound to

plough his fallows a certain number of times—in Suffolk, frequently 5 or 6—the farmer, if a little behind-hand, which will frequently occur, either from an excess of dry or of wet weather, will perhaps lose the opportunity of sowing his root crops, merely because he has not yet given the regular allowance of ploughings which he is *bound* to give, and which the land is obliged to receive, without considering whether he is doing good to the land or to himself by such proceedings.

The farmer has often been told, and doubtless with some reason, that he follows in the footsteps of his father and grandfather without stepping out of the way to make improvements in the cultivation of the soil; but as the manner of cultivating that soil by a fixed system, is often chalked out by a lawyer who is not competent to judge of its suitableness to the land, and from which the farmer is not allowed to deviate, how can it be expected that he should do otherwise than tread in the footsteps of those who have preceded him?

The amount of game is also a great drawback to improvement on much of the light land; but any remarks concerning game are uncalled for in this report, and would not in any degree promote the interests of those who occupy farms where game is preserved; for these are entered upon with an understanding that the game is to be preserved, and consequently the tenant pays a proportionably lower rent: in other words, “Game-farms are, or ought to be, let at game-rents.”

The greater part of the farm-buildings of Suffolk, improved as they may have been since the time of Arthur Young, are yet far behind the cultivation of the soil, particularly those on the heavy land. In every village are to be seen buildings arranged in every form except that which would give economy in the manufacture of manure, or in the feeding of cattle. Large and expensive barns there are—necessary, perhaps, for flail-threshing and seed-farming, but good and convenient accommodation for cattle is nearly disregarded. In a word, many of the Suffolk farmeries consist only of barns for storing and threshing grain, of a stable and yard for cart-horses, and a shed for the shelter of machines; the shelter afforded to cattle is frequently inferior to that for carts and waggons; a horsepond, the colour of the water contained in it giving evident indications of the presence of liquid manure, is the indispensable adjunct to the buildings; and it may be said, that one of the greatest improvements required is in the erection of farm-buildings with greater *accommodation* for the housing cattle and the manufacture of manure, the threshing of grain, and the preparation of food for cattle. The expenditure for the repair of buildings of this description, built with a view to economy (where stone or brick cannot be obtained,

there is no better material than clay for this purpose), would not be greater than, if equal to, that yearly spent about the present inconvenient structures. The landlord would be deriving *interest* on the money spent in the erection of good buildings, and the tenant would reap much *more* from the economical manufacture of manure, and comfort to his cattle afforded by better farm-buildings. For, in fattening cattle, scientific men have of late years taught us that warmth is *equivalent* to food; and I leave it to any practical farmer to say whether it is cheaper to supply this warmth by walls and roofs or by food.

Suffolk, so noted for machines, is yet backward in introducing the acknowledged improvements of threshing-machinery, and in substituting lighter carts for the clumsy tumbrils. Light one-horse carts would be of great advantage on the heavy soils, as they would not injure the land to nearly the same extent as the heavy loads now carried. The substitution of one-horse carts for waggons and tumbrils is not likely to be carried to any very great extent by the present race of farmers; for though many of them prefer carts, yet the disposal of the old carriages would be attended with a very great sacrifice, and the change of a smart road-waggon drawn by a team of Suffolk horses for a one-horse cart would not meet with approval.

The very light and blowing sands that are under cultivation, might be prevented from blowing by greater shelter, and be rendered more adhesive by the admixture of clay and marl where these can be obtained, and more productive by a higher system of feeding sheep.

Belts of trees, chiefly larch and Scotch fir, and hedges of the latter, afford shelter in some parts; but they require to be greatly extended before they entirely prevent the sand from blowing—high winds being as productive of injury to the crops as continued dry weather. Furze or gorse flourishes well on these barren soils, but is seldom applied to any other purpose than that of affording cover for game, a material for draining, and for firing. The kind of gorse used as provender is a variety closely allied to the gorse which grows so luxuriantly on our heaths; and therefore we may conclude that the former would grow with equal vigour, and afford to the farmers of this sterile tract a plentiful supply of food (of which there is much need) for their cattle and sheep. Those who doubt the feasibility of this improvement will be convinced by referring to the 'Essay on Gorse,' by O. Roberts, vol. vi., p. 379, of the Society's Journal.

The heavy-land district is capable of improvement by the general adoption of the system of autumn cultivation for the root-crop, and by growing such roots as can be removed at an early period from the land, and so doing away with the treading



of wet land during winter, the more free application of manures to green crops on both light and heavy land, and a better management of pasture-land. On this head Mr. Rodwell writes: "On the subject of grass-lands an essay might be well written, not only in pointing out the management of the greater proportion of every variety, but in suggesting improvements by following the examples of other grass counties. On this subject, however, I will not enlarge, and only repeat that which I have long practised, and diffused to all where the position of parties and condition of soils admit it: viz., that as a *general* rule, *pasture* and *meadow* grounds are not only *less productive* in every way to the landlord and tenant, but that the diminution of labour and the very obvious loss of production to the community, are subjects well deserving the consideration of every writer on agriculture, and feel assured that you will not lose sight of so important a feature as the "converting pasture-land into arable."

I fear I shall be unable to do more than echo these suggestions; for Mr. Bravender, in the 'Journal' (vol. vii. p. 161) has so well estimated the gain to the landowner, the tenant, the labourer, and the community at large on various descriptions of land, that I will refer those who have any doubt of the benefit to be derived from breaking up much of the pasture-land of Suffolk, to the calculations that gentleman has made in the latter part of his essay.

*Reclamation of Waste Lands.*—Much is still required in the reclamation and enclosing of waste lands, particularly the commons, some of which are even yet to be found in the heavy-land district, and are doubtless of a productive quality. There is still a considerable breadth of heath-land in the neighbourhood of Orford and Woodbridge, and on the western side of the county; much of it has so sterile an appearance that unless more than the average amount of capital and skill were employed in its reclamation it would be a profitless task. However, if long leases were granted, or compensation allowed to the tenant for improvements, there is no doubt that farmers of sufficient capital and skill would be forthcoming to render these barren tracts into a good state of cultivation. One would imagine that these barren soils and black heaths would be more profitable if planted with trees, sorts suited to the soil being selected: it would at least be a means of increasing the future productiveness of the soil, if it was ever brought into cultivation. But it is the old enclosed part of Suffolk in which there is the greatest room for the reclamation of waste land; like other early enclosed counties, a great part of Suffolk is disfigured in all directions with hedges and ditches: many of these might be removed without injury to the drainage.

The removal of the hedges that are not required, and the pollard-trees with which so many of them are so thickly studded, would reclaim more waste land than the bringing the tracts of heath into cultivation; for these are worse than waste: they require an annual expenditure to keep them in repair; their roots, by exhausting the land, injure the crops to a great distance into the fields; their shade delays the ripening and harvesting of the crops, and harbours an infinite quantity of vermin in the shape of birds and insects. Land is seldom at so dead a level that it cannot be drained on the Suffolk system (of shallow drains) if the fields do not exceed eight acres in extent (there are many of not half this area); and where there is a good fall, from 12 to 15 acres would be a more profitable size for heavy land fields.

As a common example, I observed that the Brandeston Hall estate, sold by auction by G. Robins in 1841, containing an average of about 650 acres of land, was subdivided into nearly 160 enclosures.

The condition of the agricultural labourer has undoubtedly improved; but much remains to be done by the landowners and farmers of the present day. Since the introduction of the New Poor-Law the Suffolk labourer has become more independent, and he has not that disinclination to work for his living which some of the worst-disposed of them formerly had under the old system. Though the wages at day-labour, 10s. per week, may appear a small sum for the support of a labourer and his family, yet this is far from being the sum total of his earnings; during the five weeks of harvest the Suffolk labourer is in receipt of upwards of 17. a-week; and at other times frequently earns at piece-work from 12s. to 13s. per week. It would, perhaps, be as well if the standard of wages was more generally fixed, which can only be fairly taken by adjusting the price of labour to the price of grain. The following system of paying labourers is adopted by Mr. Cooper, of Blythburgh Lodge, who farms upwards of 2000 acres, and by other East Suffolk farmers.

He takes the average price of wheat as his standard, both as being the most valuable production of the labourer's toil, and the principal article of his food:—

When wheat is above 5s. per bush. and under 6s. he pays 8s. per wk.

|   |     |   |   |     |   |      |   |
|---|-----|---|---|-----|---|------|---|
| " | 6s. | " | " | 7s. | " | 9s.  | " |
| " | 7s. | " | " | 8s. | " | 10s. | " |

Thus increasing 1s. per week for every 1s. per bushel increase in the price of wheat.

Mr. C. also allows the labourers flour at the wholesale price. He makes a bargain with the miller to supply his labourers; in this manner the labourer gets the profit of the flour-dealer. At first, Mr. C. thought of buying flour in large quantities, and

letting his labourers have it at cost price; but, as this would interfere with the miller's trade, he now pays the miller himself, or engages to see him paid, and gets the money from his labourers in weekly instalments: they may take as little as 2 stone, or as much as half-a-sack; thus, when flour is cheap, they can lay in a stock. Mr. C. gets a list of the quantity required by each man, and the miller sends his cart round once a-week. It is, of course, quite optional for the labourer to take his flour in this way or not.

Taking the labourers generally, it would be to their advantage if some means were adopted for a more general and efficient education than they now receive at the village school.

Many landowners object to investing money in cottages, thinking by so doing they will burden their estates with poor. But this only drives the labourer into the hands of the speculator, who builds cottages and lets them at an exorbitant rent.

The Rev. Copinger Hill, in his 'Essay on Cottages' (in the 'Journal'), has proved that the erection by the landlord of comfortable cottages, with a garden attached, let at a reasonable rent, will pay good interest for the money invested. Cottages built of clay, the warmest and driest material that can be used, may be let at 3*l.* per annum; and where this is done, the speculator, who crowds a lot of cottages on a small plot of ground, and lets them from 5*l.* to 6*l.* each, will be driven from the field. All agree that the condition of the labourers is improved by annexing a large garden to the cottage; this does away with the necessity of field-allotments, the usefulness of which has many advocates, though some are of quite a different opinion respecting them. "Spinning" yarn by hand is now nearly superseded by the introduction of machinery.

I must apologise for having entered so minutely into the details of management: my reason for doing so is to render the report intelligible to farmers in a distant part of the country, for there are many local phrases used in our farming operations which would be perfectly unintelligible to the farmers of another county.

I am deeply indebted to many of the Suffolk farmers for their kind and ready assistance in affording me information on the various subjects of this Report, and to these gentlemen I beg to tender my sincere thanks; and I hope the use that I have made of the information which they have afforded will not be deemed altogether unworthy. If the Report possesses any merit, it belongs mainly to them: if it is considered unworthy of the county, the agriculture of which it has been my endeavour to describe, the disgrace rests upon myself; but should I be unfortunate in obtaining the good opinion of the agricultural reader, the Report

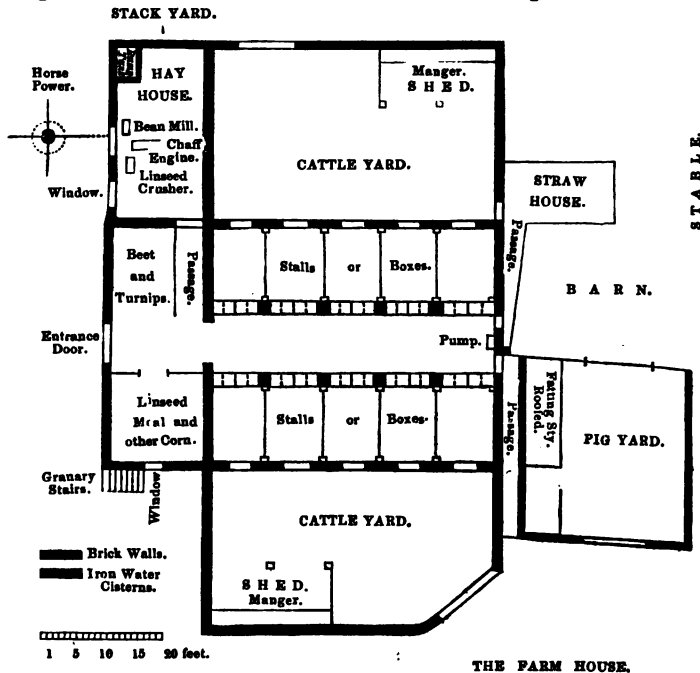
may perhaps be viewed less critically when it is known that it was written with a view of acquiring rather than of imparting knowledge.

## APPENDIX.

### 1. Linseed Compound.

MANY Suffolk farmers during the last few years having substituted compound in lieu of linseed-cake, a few observations on the system of compound-feeding, derived from practical experience, may not be considered out of place.

Mr. Peirson, of Framlingham, a gentleman who adopts the system, has kindly favoured me with a plan (which is here annexed) of his feeding-shed, and an account of his manner of feeding.



"I am pleased my bullock-shed attracted your attention, believing there is scarcely another in Suffolk combining the same advantages for grazing, with economy in building. The elevation is 8 feet 2 inches from level of ground to under-side of beams, which some persons have thought 1 foot too much. The roof of one span, and covered with pan-tiles; the stalls are all sunk from  $1\frac{1}{2}$  to 2 feet below the level; the pump

is supplied by the troughs around the building, and seldom fails of water. The width of passage between the stalls allows of carting in turnips, &c. The stalls are adapted for tying up two beasts in each, two polled or one-horned bullocks may be loose. I generally have two in each stall during the winter, and one during the summer months. When two are tied up, the manure taken from them is thrown into the outer cattle-yards, and again foddered upon by leaner cattle. When loose in the stalls, nothing is removed till quite full; there is a drainage from the stalls and piggeries to the tank; the tank is a large bricked arch running under the hay-house about 6 feet in depth. Each stall having separate doors, I am enabled to regulate the heat of my shed, opening the upper doors on the contrary side to the wind; and, during the heat of the last summer, I closed them all. The shed being dark, the bullocks were not troubled by flies, and the ventilation in the roof kept them cool. Three strong ash rails divide the stalls, fastened with pegs into the posts, that they may be removed in an instant if required. The doors are also guarded by two ash rails (removable).

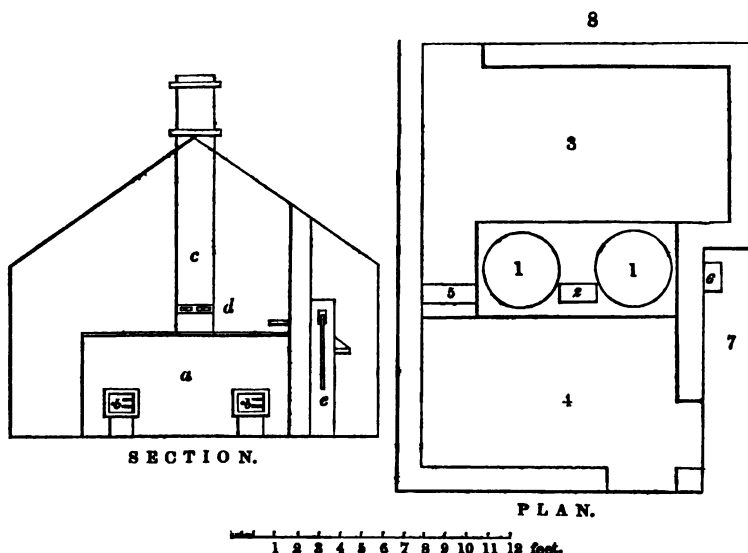
"My plan of making the compound is to put 9 pails of water into a copper; when boiling-hot, scatter in 2 pecks of crushed linseed, boil this five minutes, then stir in 4 pecks of bean or pea meal; as soon as this is done, take away the fire that it may not burn. With a wooden shovel empty the contents of the copper into two small tubs, where it may remain till next morning, when, being turned over, they will show you two puddings of about 10 stone each (14 lbs. per stone). This is ready to slice and give to the cattle. As the bullocks progress, I increase the linseed. For the last two years I have cooked 20 stone daily, with few exceptions.

"The cost of my pudding, including fire and labour, I estimate at 4½d. per stone; and this I believe equal to two English cakes at 6d.

"I engage my man to be in the shed at 5 o'clock every morning, and to give 1 stone of pudding to each beast as the first food. From 1 to 2 bushels of roots are given during the day, and 3 or 4 half-peck baskets of hay or other chaff, generally mixing with it 1 to 2 pints of crushed linseed, and 4 pints of bean-meal. Every evening at 8 o'clock, from 2 to 4 lbs. of uncut hay are given to each, if the stack-yard will allow of it. When the bullocks are getting fat, I increase the pudding to 2 stone per head, and reduce the roots to 1 bushel each. The beasts are supplied with water. By preparing common white turnips, swedes, mangel wurzel, tares, clover, and grass, I have a succession of green food the whole year. The food is prepared and placed in baskets near each beast before any is given, so that all may be eating at the same time, and, owing to this regularity of feeding, all the bullocks are generally laid within 5 minutes after eating their allotted quantity."—*Dec. 24th, 1846.*

In addition to these excellent observations, I beg to give a plan of a boiling-house, two or three of which have lately been fitted up for the preparation of compound on a considerable scale.

The boiling-house, of which the annexed drawing is a plan, occupies the angle formed by the bullock-shed and piggery.



*Reference to Plan.*

1, 1. Iron boilers holding 100 gallons each. Two boilers are greatly to be preferred to one, as a man can tend two fires at the same time. The top of the brickwork is covered with one-inch boards, the boiler-lids are made in two pieces for the convenience of taking off, and they fit close into the covering of boards.

2. Flue.

3. The brick floor of this compartment is raised about 9 inches, and the part (4) in front of the furnace is lowered about 9 inches. The floor at the back of the boiler being raised gives great convenience for stirring and mixing the compound, and in removing it from the boilers. The common situation of a copper at the side or in the corner of a building will not admit of this arrangement, for the man employed in stirring would be obliged to be elevated on a stool immediately in front of the furnace, which is not a very agreeable position, or one in which the man is likely to perform his work as it ought to be done. Some portion of this place may be fitted with tubs or cisterns for the reception of the compound.

4. Place in front of furnace for tending the fire and keeping a supply of fuel.

5. Steps.

6. Pump. The water is pumped directly into either copper; it also supplies water to the cattle and pigs.

7. Piggy.

8. Bullock-shed.

*Section.*

a, Boilers.

b, b, Furnaces.

c, Flue.

d, Dampers for regulating the fire and putting it out when required. The dampers are of great service, as without them there is some danger of the mixture boiling over when the linseed is added to the water; they also effect a saving in the fuel.

e, Pump.

The building is lighted by glass tiles in the roof, and the steam passes out by a lever boarded window, and through interstices formed by lapping the ridge-tiles over one another.

The grain and linseed require to be crushed, and the straw or hay to be cut into chaff before it is prepared. Hurwood's, of Ipswich, is

one of the best mills for crushing linseed, oats, &c. ; but whatever kind are used, they should admit of being driven by horse-power or by steam.

The mills are placed over the chaff-machine, and can be worked at the same time, and driven by the same power, as the chaff-cutter.

The following is the actual time of crushing, the mills being each driven by one horse, the increase of bulk by crushing, and the cost.

Parsons' and Clyburn's V. mill crushes 1 qr. of peas or beans in 40 minutes.

|                            |    |                       |        |          |
|----------------------------|----|-----------------------|--------|----------|
|                            |    |                       | h.     | m.       |
| Hurwood's mill,            | 1  | quarter of linseed in | 1      | 20       |
|                            | 1  | ,, barley .           | 1      | 0        |
|                            | 1  | ,, oats .             | 1      | 0        |
|                            |    |                       | Whole. | Crushed. |
|                            |    |                       | lbs.   | lbs.     |
| 1 bushel of linseed weighs | 51 |                       |        | 32       |
| 1 ,, barley ,,             | 54 |                       |        | 36       |
| 1 ,, peas ,,               | 67 |                       |        | 49       |
| 1 ,, oilcake ,,            | —  |                       |        | 45       |

The cost for the labour of attendance, horse, and wear and tear of the machinery is about 8*d.* per qr. for oats and barley, 10*d.* for linseed, and about 6*d.* for peas.

Though grain cannot be ground to powder by these mills, yet their use is a very great saving on the practice of sending grain to be ground by the miller, whose charge is about 2*s.* 6*d.* per qr. Oats may be ground as well by a steel mill, and linseed much better than it can be done by stones.

It would be an endless task to attempt to describe all the different ways of preparing compound adopted by different farmers. Linseed being the foundation upon which the compound is based, the other substances employed are barley, peas, beans, gold of pleasure, and a cheaper compound of boiled linseed and cut hay, straw, &c. As a general maxim, the constituent which forms the largest proportion in the linseed compound is that which bears comparatively the lowest price in the market; thus, in 1845, when barley was at a low price, a great quantity was made into compound: it also affords a ready means of converting dross and inferior grain into a nutritious food.

*Estimate and manner of preparing a Compound of Peas, Linseed, and Barley.*

A 100-gallon boiler of compound is prepared in the following manner:—

|                                    | Stone | lbs.             |
|------------------------------------|-------|------------------|
| 2 bushels of crushed peas weighing | 7     | 0                |
| 2 ,, linseed ,,                    | 4     | 8                |
| 6 ,, barley ,,                     | 15    | 6                |
|                                    | 27    | stone of 14 lbs. |
| 64 gallons of water weighing       | 45    |                  |
| Total                              | 72    |                  |

Sixty-four gallons of water being pumped into the boiler, 2 bushels

of crushed peas are put in, and the fire lighted. The peas will require boiling from 2 to 3 hours, till the mixture nearly resembles pea-soup, and the peas feel soft and mealy; one person now sprinkles 2 bushels of crushed linseed gradually by hand into the boiler, while another stirs up the mixture. The stirrer, or "rudder," is similar to those used by brewers; the stirring part may either be made of wood or iron. When the linseed is dissolved, the 6 bushels of crushed barley are gradually stirred into the boiler, until the whole is well mixed and incorporated together. The fire should now be put out by closing the damper; this will be of great use throughout the entire operation in regulating the fire. The copper-lids are put on: if the compound remains in the boiler it will be cool enough for the cattle the following day. The ingredients thus made will fill a 100-gallon copper, and will weigh about 68 stone, showing a loss of 4 stone by boiling.

From 1 to 2 stone of this compound is given with chaff to each bullock per day, at 3 baits. For sheep, a quantity is removed from the boiling-house to the field or shed in which the sheep are fattening, and it is given night and morning at the rate of about 2 lbs. per sheep per day; but this of course varies with the size and condition of the sheep.

Average estimate of cost of 68 stone of compound:—

|                                | £.    | s. | d. |
|--------------------------------|-------|----|----|
| 7 st. peas . . . . .           | 0     | 7  | 0  |
| 15 st. 6 lbs. barley . . . . . | 0     | 15 | 0  |
| 4 st. 8 lbs. linseed . . . . . | 0     | 6  | 6  |
| Attendance and fuel . . . . .  | 0     | 1  | 6  |
|                                | <hr/> |    |    |
|                                | £1    | 10 | 0  |

This will be rather over 5½d. per stone, or 3l. 10s. 7d. per ton.

## 2. Clay Walling.

Throughout the heavy land of Suffolk cottages and farm-buildings are principally, and farm-houses very often, constructed with clay walls. Clay houses whitewashed, plastered, or stuccoed, are not only neat in appearance, but are warm and durable.

Clay walls appear peculiarly adapted for the walls of sheds and for enclosing farm-yards; they are cheap, warm, never give out damp, and, if kept dry at top and bottom, will last for a great length of time. I have seen some that have stood 50 years with very slight repair, which were in every respect as good as when first put up. Cattle are not liable to injury by rubbing against them, as they are with rough stone walls. Clay walls are placed on a stone or brick pinning of from 2 to 2½ feet high, or about as high as the manure rises in the yards; when completed, the walls are covered to prevent their being washed down by the rain, the material used being a brick coping, slate, boards, thatch, &c. The cost of building a wall 14 inches thick is 9d. per square yard, the stone pinning 6d. per foot run extra, the thatching about 1s. 6d. per yard run. This does not include the straw, or the cost of raising clay. The whole expenditure for a 14-inch wall is about 1s. a square yard. For further information as to the preparation of the clay, &c., see the Rev. C. Hill's 'Essay on Cottages,' Journal, vol. iv., p. 356.

*Hengrave, Bury St. Edmunds, February, 1847.*





ON THE

## AGRICULTURE OF SUFFOLK.

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THE foregoing pages comprise all that was originally printed in the Royal Agricultural Society's Journal, vol. viii., p. 261. The additional matter consists of

1. A review of the former state of Agriculture in the county.
  2. The opinions of correspondents residing in various parts of the county, upon the present state of agriculture,—referring more particularly to the subjects named by the Society,—to Suffolk leases, and to statistical returns of the farming.
  3. Memoirs of those persons who have rendered themselves celebrated, either as agriculturists or agricultural mechanists: among others, a Life of the late Arthur Young, Esq.
  4. A description (with woodcuts) of the agricultural machines invented or manufactured in the county.
  5. The farmers' clubs, with their discussions, &c.
  6. The agricultural labourer—his manner of life, &c.; with a catalogue of the local words in use among the labouring classes.
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### *I.—A Review of the former state of Agriculture in the County.*

Under this head I shall give (so far as I am able) a history of the agriculture of the county at different periods, shewing also when any particular point of husbandry was first practised. I shall begin this review or history with Tusser; for even if it was possible (which from want of documents it is not) to go farther back, the state of agriculture at a more distant period would neither be worth my explanation, nor the imitation of any of the present race of farmers.

Tusser's 'Five Hundred Points of Good Husbandry,' published in the reign of Elizabeth, may be considered as the first Agricultural Report of Suffolk and Essex. Tusser, born in Essex, and brought up as a musician, both lived and learnt the art of farming in Suffolk (at Catwade, a hamlet of Brantham, near Ipswich), and his work, the first edition of which was published in 1557, while he lived there, is merely a collection of the notions, axioms, and practices of the neighbouring farmers

turned into rhyme. "Tusser," says Stillingfleet, "was useful, by diffusing over the kingdom that knowledge which he had gained in Suffolk and Essex, where farming was at that time the best understood; for he observes that enclosing was more common in those counties than elsewhere, and it is a certain truth, that nothing more improves agricultural skill than enclosures, or rather, enclosing is the consequence of skill." Tusser mentions the Flemings, on which Mavor remarks:—"In that part of the coast where our author lived many Flemings had settled, and their language and customs, as I am credibly informed by intelligent natives, may still be traced in Essex, Suffolk, and Norfolk."

How far the Flemings influenced our agriculture, I shall consider in a future place.

Tusser mentions hops, hemp, and flax as well known crops. Enclosures as particularly common in Suffolk and Essex; and there is a very good comparison between champion (open field) country and severall (enclosed). Vetches were much grown in Norfolk, which appears then to have been all open or champion country. There is nothing to be found in Tusser about serfs (or bondmen) as in FitzHerbert's works; but the labourers appear to have lived in the house and eat with the master, as may be still practised with a few of the old-fashioned small farmers of the present day. The housewife distilled and dried herbs, &c.

Tusser mentions most of the present agricultural hand-tools and practices, and many of the local words of Suffolk.

Thus, for instance, in the following short extract, we find no less than five Suffolkisms. He is describing malting:—

"Take heed to the *kell* (kiln), sing out as a bell;  
Be *süer* (sure) no chances to fiër can draw  
The wood or the *furzen*, the *brake* (ferns) or the straw."

It is said that claying, marling, and draining were unknown, because not mentioned by Tusser; but he in various parts mentions compost, or compas—that is, manure mixed in layers with heavy stuff (clay or chalk); and I have before shown that covered drains, exactly resembling both Smith's and the Suffolk ones, were known in Pliny's and Columella's time. Tusser's farm at Katwade was not one that particularly required draining, consisting, as it did, of light land, where no drains were wanted, and of marsh, where the drains and ditches were open. Yet he mentions among his implements

"A didle and crome  
For *draining* of ditches that 'noys thee at home."

A didle is a triangular spade, with edges quite sharp, to cut the sides of the small open drains; and a crome, probably a draining scoop. Again he mentions

“ A skuppatt and skavell, that marshmen allow.”

Both the name and nature of a skuppatt are well known: a skavell somewhat resembles a peat-spade.

Among other practices of Tusser, some of which might perhaps be still practised with advantage, we find seething (or boiling) of grains for cows, oxen, and pigs; for the latter, in a very thin consistence. This may be useful, as the grains in brewing have not a boiling heat, and the after-boiling must extract all the remaining goodness. Brake, or fern, was also cut in August, and used for malting, baking, and other firing; and in November the hogs were driven into the woods to feed on the roots of the fern. Sloes steeped in boiling-water, and mixed with chalk, were given to cows as a remedy for the flix, or flux; and verjuice was used for some other complaints.

The improvements in modern agriculture over that mentioned by Tusser, consist in the better rotation of crops, leading to the enlargement of the winter stock of cattle and sheep, in the increase of knowledge, and the consequent banishment of superstition.

Tusser's work is also interesting, from the information it gives us with respect to the household habits of the farmers three centuries since. It is evident that they then lived very much upon salt-fish: at Easter they had veal and bacon: at Martinmas beef—

“ When Easter comes, who knows not than  
That veal and bacon is the man;  
And Martilmas beef doth bear good tack  
When country folk do dainties lack.”

Before the Feast of St. John, mackerel; fresh-herrings at Michaelmas; at Hallowtide, sprats and spurlings; for Christmas fare they seemed to have all the modern standing dishes.

“ Good bread and good drink, a good fire in the hall,  
Brawn, pudding and souse, and good mustard withal;  
Beef, mutton, and pork, shred-pies of the best,  
Pig, veal, goose and capon, and turkey well drest.  
Cheese, apples, and nuts, jolly carols to hear,  
As then in the country is counted good cheer.”

They bought, in Tusser's time, stocks of salt-fish, such as would amaze a modern farmer in these Protestant days, when, by the disuse of fasting, and by the increase of green winter food, cattle and sheep are kept easily through the winter, and fresh meat is always to be had. Few farmers would now think of undertaking a journey to buy fish; yet he thus directed the farmer of the 16th century:—

“ When harvest is ended take shipping and ride,  
Ling, salt-fish, and herring for Lent to provide ;  
Get home that is bought, and go stack it up dry,  
With pease-straw between it, the safer to lie.”

In October Husbandry Tusser tells us what kind of corn was then principally grown in Suffolk :—

“ Each soil has no liking of every grain,  
Nor barley nor wheat is for every plain ;  
Yet know I no country so barren of soil  
But some kind of corn may be gotten with toil.  
In Brantham, where rye but no barley did grow,  
Good barley I had, as a many did know,  
Five seam\* of an acre I truly was paid  
For thirty load muck on each acre so laid.  
In Suffolk again, whereas wheat never grew,†  
Good husbandry used good wheat-land I knew ;  
This proverb experience long ago gave,  
That nothing who practiseth, nothing shall have.”

In ‘ A Poetical Life of the Author, written by Himself,’  
Tusser praises Suffolk highly :—

At Kat-  
wade, in  
Suffolk, this  
book first  
devised.‡

“ When court gan frown, and strife in town,  
And lords and knights saw heavy sights,  
Then took I wife and led my life  
In Suffolk soil.  
Then was I fain *myself to train*  
*To learn too long the farmer’s song,*  
In hope of pelf, like worldly elf,  
To toil and moil.

Ipswich com-  
mended.

When wife could not, through sickness got,  
More toil abide so nigh sea-side ;  
Then thought I best from toil to rest,  
And Ipswich try.  
A town of price, like Paradise,  
For quiet then, and honest men ;  
There was I glad, much friendship had,  
A time to lie.

The death of  
his first wife.

There left good wife this present life,  
And there left I, house charges lie ;  
For glad was he might send for me,  
Good luck so stood.  
In Suffolk there, where everywhere,  
Even of the best, besides the rest  
That never did their friendship hide  
To do me good.

\* Quarter.

† Perhaps not in sand lands.

‡ This note added to edit. of 1889.



Where find ye, go search any coast,  
 Than these where enclosure is most.  
 More work for the labouring man,  
 As well in the town as the field,  
 Or thereof (devise if ye can)  
 More profit what countries do yield;  
 More seldom where see ye the poor  
 Go begging from door unto door.

Champion. In Norfolk behold the despair  
 Of tillage, too much to be borne,  
 By drovers from fair to fair,  
 And others destroying the corn;  
 By custom and covetous pates,  
 By gaps, and by opening of gates.  
 By Cambridge, a town I do know,  
 Where many good husbands do dwell,  
 Where losses by losels do show  
 More here than is needful to tell;  
 Determine at court what they shall,  
 Performed is nothing at all."

The following, from Tusser, will not only show what implements were used, but give some idea of the state of agriculture:—

*" Husbandry Furniture.*

" Barn locked, gove-ladder,<sup>1</sup> short pitchfork and long,  
 Flail, strawfork and rake, with a fan that is strong;<sup>2</sup>  
 Wing, cartnave,<sup>3</sup> and bushel, peck, strike, ready hand,  
 Get casting-shovel,<sup>4</sup> broom, and a sack with a band;  
 A stable well planked with key and with lock,  
 Walls strongly well lined, to bear off a knock,  
 A rack and a manger, good litter and hay,  
 Sweet chaff and some provender every day;  
 A pitchfork, a dungfork, sieve, skip,<sup>5</sup> and a bin,  
 A broom, and a pail to put water therein;  
 A handbarrow, wheelbarrow, shovel and spade,  
 A curry-comb, mane-comb, and whip for a jade,  
 A buttrice<sup>6</sup> and pincers, a hammer and nail,

<sup>1</sup> A gofe is a mow, and the gove-ladder is for the thrasher to ascend and descend in order to throw down the sheaves with the assistance of the short pitchfork, while the long was for pitching the straw.

<sup>2</sup> The straw-fork and rake were to turn the straw from off the threshed corn, and the fan and wing to clean it.

<sup>3</sup> A cart-nave might be required to stand on in this operation.

<sup>4</sup> A casting-shovel, such as maltmen use, enables the farmer to select the best and heaviest grains for seed, as they always fly farthest if thrown with equal force.

<sup>5</sup> A small basket, or wooden vessel with a handle, to fetch corn in, and for other purposes.

<sup>6</sup> A buttrice is to pare horses' hoofs with.

And apron and scizzars for head and for tail,  
 Whole bridle and saddle, whitleather and nail,<sup>7</sup>  
 With collars and harness, for thiller and all;  
 A pannell and wanty,<sup>8</sup> packsaddle and ped,  
 A line to fetch litter, and halters for head,  
 With crotchets and pins to hang trinkets thereon,  
 And stable fast chained that nothing be gone;  
 Strong axle-treed cart that is clouted and shod,  
 Cart-ladder and wimble, with perser and pod,<sup>9</sup>  
 Wheel-ladder for harvest, light pitchfork and tough,  
 Shave,<sup>10</sup> whip-lash well knotted, and cart-rope enough,  
 Ten sacks, whereof every one holdeth a coom,  
 A pulling-hook handsome<sup>11</sup> for bushes and broom;  
 Light tumbrel and dung crome<sup>12</sup> for easing Sir Wag,  
 Shovel, pickax, and mattock, with bottle and bag,  
 A grindstone, a whetstone, a hatchet, and bill,  
 With hammer, and English nail sorted with skill,  
 A frower<sup>13</sup> of iron for cleaving of lath,  
 With roll for a saw-pit good husbandry hath,  
 A short saw and long saw to cut atwo logs,  
 An axe and an adze to make trough for the hogs.  
 A Dover-court beetle<sup>14</sup> and wedges with steel,  
 Strong lever to raise up the block from the wheel,  
 Two ploughs and a plough-chain, two culters, three shares,  
 With ground-clouts and side-clouts for soil that sow tares,  
 With ox-yokes, and ox-bows, and other things mo,  
 For ox-team and horse-team in plough for to go;  
 A plough-beetle, plough-staff, to further the plough,  
 Great clod to asunder that breaketh so rough;  
 A sled for a plough and another for blocks,  
 For chimney in winter to burn up their docks;  
 Sedge collars for plough-horse for lightness of neck;  
 Good seed, and good sower, and also seed peck;  
 Strong oxen and horses well shod and well clad,  
 Well meated and used for making thee sad.  
 A barley-rake toothed with iron and steel,  
 Like pair of harrows and roller doth well.  
 A sling for a mother, a bow for a boy,  
 A whip for a carter is Hoy de la roy.<sup>15</sup>

<sup>7</sup> Whitleather is to mend harness with, and a nail is an awl such as collar-makers use.

<sup>8</sup> A leather tye (Womb tye).

<sup>9</sup> A box, or old leather bottle, nailed to the side of the cart to hold grease.

<sup>10</sup> An instrument with two handles, used for working down wood to its proper size and form.

<sup>11</sup> A barbed iron for drawing firing from the woodstack.

<sup>12</sup> A bent dung-hook.

<sup>13</sup> A tool used for cleaving of lath.

<sup>14</sup> At Dover Court, near Harwich, grows a strong, knotted, and crooked sort of elm, famous for wearing like iron. Naves made of this are much sought after by wheelwrights and others, as being very durable and not subject to split.

<sup>15</sup> A cant term for just as it should be—a sling for a "mawther" and bow for a boy, was used in bird-keeping.



A brush-scythe and grass-scythe, with rifle<sup>16</sup> to stand,  
 A cradle for barley with rubstone and sand,  
 Sharp sickle and weeding-hook, hayfork and rake,  
 A meak<sup>17</sup> for the peas and to swinge up the brake,  
 Short rakes for to gather up barley to bind,  
 And greater to rake up such leavings behind ;  
 A rake for to hale up the fitches that lie,  
 A pike<sup>18</sup> for to pike them up handsome and dry,  
 A skuttle<sup>19</sup> or skreen to rid soil from the corn,  
 And shearing-shears ready for sheep to be shorn.  
 A fork and a hook to be tampring in clay,  
 A lath-hammer, trowell, a hod or a tray ;  
 Strong yoke for a hog with a twicher<sup>20</sup> and rings,  
 With tar in a tar-pot for dangerous things.  
 A sheep mark, a tar-kettle, little or mitch,  
 Two pottles of tar to a pottle of pitch ;  
 Long ladder to hang all along by the wall,  
 To reach for a need to the top of thy hall ;  
 Beam-scales with the weights that be sealed and true,  
 Sharp mole-spear with barbs, that the moles do so rue ;  
 Sharp-cutting spade for the dividing of mow,  
 With skuppatt<sup>21</sup> and skavell that marshmen allow,  
 A sickle to cut with a didall and crome  
 For draining of ditches that 'noyes thee at home.  
 A clavestock and rabbetstock carpenters crave,  
 And seasoned timber for firewood to have,  
 A jack for to saw upon fuel for fire,  
 For sparing of firewood and sticks from the mire,  
 Soles,<sup>22</sup> fetters, and shackles, with horselock and pad,  
 A cowhouse for winter so meet to be had,  
 A sty for a boar and a hog's cote for hog,  
 A roost for thy hens, and a couch for thy dog."

Tusser gives the following " Directions for Cultivating a Hop Garden :"—

" Whom fancy persuadeth, among other crops,  
 To have for his spending sufficient of hops,  
 Must willingly follow of choices to choose  
 Such lessons approved as skilful do use.  
 Ground gravelly, sandy, and mixed with clay,  
 Is naughty for hops any manner of way ;  
 Or if it be mingled with rubbish or stone,  
 For dryness and barrenness let it alone.

<sup>16</sup> An old scythe with a particular kind of sned to cut up weeds. A rifle is a bent stick standing on the but of a scythe, by which the corn is struck into rows.

<sup>17</sup> A hook at the end of a handle about 5 feet long, to hackle up peas.

<sup>18</sup> A pitchfork.

<sup>19</sup> A large kind of skip.

<sup>20</sup> A twicher is used for clenching hog-rings.

<sup>21</sup> A skuppatt, or scoop, is used in marsh-lands to throw out the thin mud from the ditches, and a skavell somewhat resembles a peat-spade.

<sup>22</sup> Soles—coarse leather soling for shoes.

Choose soil for the hop of the rottenest mould,  
Well dunged and wrought as a garden plot should ;  
Not far from the water, but not overflown—  
This lesson, well noted, is meet to be known.

The sun in the south, or else southly and west,  
Is joy to the hop as a welcomed guest ;  
But wind in the north, or else northerly east,  
To the hop is as ill as a fay in a feast.

Meet plot for a hop-yard once found, as is told,  
Make thereof account as of jewel of gold :  
Now dig it and leave it, the sun for to burn,  
And afterwards fence it to serve for that turn.

The hop for his profit I thus do exalt,  
It strengtheneth drink, and it flavoureth malt,  
And being well brewed, long kept it will last,  
And drawing abide—if ye draw not too fast."

From the frequent directions Tusser gives respecting the management of hops, we may infer that almost every person who had a proper spot cultivated some at least for their own use, and it is very probable that Suffolk was the first county in which they were grown. Hops were introduced into England from Flanders in the reign of Henry VIII., and are then mentioned as being grown in Suffolk, whereas 'Baxter's Library of Agriculture' says, "they were first successfully cultivated in Kent in 1693;" and, as the "Surrey Report" says, "the culture brought from Suffolk to Farnham about A.D. 1600." Bullein, who wrote his 'Bulwarke of Defence' in the middle of the 16th century, mentions their growing at Brusyard, near Framlingham, and at many other places. The same writer, in his 'Government of Health,' observes that, "though there cometh many good hops from beyond sea, yet it is known that the goodly stilles and fruitful grounds of England do bring forth unto man's use as good hops as groweth in any place in this world, as by proof I know in many places in the county of Suffolke, whereas they brew their own beere with the hops that grow upon their own grounds."

A.D. 1600.

A short account of Suffolk Husbandry at this date may be seen in Camden's 'Britannia,' first published in 1586, from researches in the eastern and northern counties: the edition of 1607 is that which received his finishing touches. I extract the following from Dr. Holland's Translation.

"Suffolk, called by the Saxons Sud-folc, *i.e.* South-folk, is a large county, and full of havens of a fat and fertile soil (unless it be eastward); being compounded as it is of clay and marle; by means of whereof there are in every place most rich and

goodly corn-fields, with pastures as battable, for grazing and feeding of cattle. And great store of cheeses are there made, which, to the great commodity of the inhabitants, are vended into all parts of England, nay, into Germany, France, and Spain also, as Pantaleon the physician writeth, who stuck not to compare these of ours for colour and taste both with those of Placentia; but he was no dainty-toothed scholar out of Apicius' school. Neither be there wanting woods here, which have been more plentiful, and parks, for many there are lying to noblemen's and gentlemen's houses *replenished with game*."

Fuller, in his 'Worthies,' published 1662, thus speaks of Suffolk. After naming the adjacent counties and giving the dimensions, he goes on—"The air thereof is generally sweet and by the best physicians esteemed the best in England, often prescribing the receipt thereof to consumptionish patients. I say generally sweet, there being a small parcel nigh the seaside not so excellent, which may seem left there by nature in purpose to advance the purity of the rest.

#### "NATURAL COMMODITIES.

"*Cheese*.—Most excellent are made therein, whereof the finest are very thin, as intended not for food but digestion. I remember when living in Cambridge, the cheese of this county was preferred as the best. If any say that scholars' palates are incompetent judges, whose hungry appetites make coarse diet seem delicate unto them, let them know that Pantaleon the learned Dutch physician counted them equal at least with them of Parma in Italy.

"*Butter*.—For quantity and quality this county doth excel, and venteth it at London and elsewhere. The child not yet come to, and the old man who is past the use of teeth, eateth no softer, the poor man no cheaper (in this shire), the rich no wholesomer food, I mean in the morning. It was half of our Saviour's bill of fare in his infancy: 'Butter and honey shall he eat.'"

"Suffolk milk" is mentioned as a proverbial expression. "This was one of the staple commodities of the land of Canaan, and certainly most wholesome for man's body, because of God's own choosing for his own people. No county in England affords better or sweeter of its kind, lying opposite to Holland in the Netherlands, where is the best dairy in Christendome."

1732.

From 'The Suffolk Traveller,' by Mr. John Kirby, of Wickham Market, who took an actual survey of the whole county in the years 1732, 1733, and 1734, I make the following extracts. I copy from the 2nd edition, 1764:—

" This county may be considered as naturally consisting of three different sorts of land, viz. the sandland, the woodland, and the fielding.

" The sandland part is that tract of land, which reaches from the river Orwell, by the sea-coast to Yarmouth, and is pretty nearly separated from the woodlands by the great road leading from Ipswich, through Saxmundham and Beccles, to Yarmouth; so that it contains the hundred of Colneis, and part of the hundreds of Carlford, Loes, Wilford, Plomesgate, Blything, Mutford, and Lothingland. This part may also be subdivided into the marsh, arable, and heathland. The marshland is naturally fruitful, feeding great numbers of sheep and oxen; and sometimes when ploughed affords greater crops of corn than any other land in the county. That part which is arable is in many places naturally good for tillage, and produces abundant crops of all sorts of corn and grain: and where it seems in a manner barren, it is fit for improvement by chalk, clay, and crag; which last is found by experience to be preferable to the other two, and may be had cheaper. The heathy part, commonly used for sheep-walks, might contain about one-third of the sandlands, before the discovery of crag, but many hundred acres of them are now converted into good arable land, by that excellent manure.

" The woodland part extends from the north-east corner of the hundred of Blything, to the south-west corner of the county at Haverhill, and includes part of the hundreds of Carlford, Wilford, Loes, Plomesgate, Blything, Blackbourn, Thedwastre, and Thingoe; and all the hundreds of Risbridge, Babergh, Cosford, Samford, Stow, Bosmere, Claydon, Hartesmere, Hoxne, Thredling, and Wangford. This part is generally dirty, but very rich and fruitful. Here the Suffolk butter is made, justly esteemed the pleasantest and best in England; but they who make good butter must of course make bad cheese, and therefore the generality of Suffolk cheese is well known to be as remarkably bad as the butter is good. But those few in these parts that make little or no butter make as good cheese as any in Warwickshire, Gloucestershire, or any other parts of the kingdom, insomuch that it sells for 10*d.* and 12*d.* a pound or more, being little, if at all, inferior to that of Sulton.

" The fielding part contains all the hundred of Lackford, and the remaining parts of the hundreds of Blackbourn, Thedwastre, and Thingoe, and is most of it in sheepwalks, yet affords good corn in many places."

1770.

Extracts from Young's 'Farmer's Tour through the East of England,' printed 1771, vol. ii., letter 15, page 164:—"From Yarmouth to Beccles the country is various, but generally cultivated pretty well; rents rise from 9s. to 16s.

"Their products of corn are as follows:—Wheat, 2 quarters; barley,  $2\frac{1}{2}$  quarters; oats, 4 quarters; beans, 4 quarters; turnips, worth 30s.; clover, 2 loads of hay at two mowings. They use only wheel-ploughs and *but two horses*. In several parts of this county, particularly towards Hoxton and Rumburgh, there are very great dairies kept up to 40, 60, and 70 cows, which they use all for butter and cheese; their cows give from 2 to 8 gallons of milk a day; the breed all the little Suffolk mongrel; one of them will eat 2 acres of grass in summer, and, if she has nothing else, a ton and a half of hay in winter. They calculate the product from 4l. to 5l. each; but many dairies are let at 3l. 5s. a head. They reckon that each cow maintains a hog. The attention upon them is in proportion to three dairymaids and one boy to 40 cows. On a farm of 250l. a-year they often keep 60 cows; and they reckon 3000l. necessary to stock a dairy one of 300l. a-year. Farms in general rise from 100l. to 300l. a year. From Beccles to Yoxford, I observed little patches of hemp in the gardens of most of the cottagers, which is an instance of industry much to their honour. At Yoxford I observed for the first time swing-ploughs chiefly used. Towards Saxmundham and about that place the soil is all sandy. Two miles on the other side of it, towards Woodbridge, I remarked exceedingly good crops. Rents rise from 6s. to 17s., but on average are 14s. Farms from 100l. to 500l. a year.

"Their crops: wheat,  $2\frac{1}{2}$  or 3 quarters; barley, 4; oats, 4; peas, 3 quarters, all hand-hoed; beans, 4 or 5 quarters, all hand-hoed twice, and many in drills. They cultivate some carrots, but not so many as nearer to Woodbridge; but they are greatly to blame, for when they do sow that root, they get 5 bushels per square rod, which are 800 per acre, and at 1s. come to 40l. They give them their horses instead of oats, and also fatten hogs on them.

"But the famous husbandry of this county is near Woodbridge, particularly in the space of country comprehended in the parishes of Eyke, Wantisden, Bromeswell, Sutton, Ramsholt, Alderton, and Bawdsey; through which country I have passed with pleasure. The sands about Capel St. Andrew's are poorer; they form one farm of nearly 4000 acres. The former places lie pretty much together, forming a retired corner of the world, scarcely ever visited by travellers, and yet abounding in several

*instances with the best husbandry in Britain. In many particulars it will surprise a stranger more than anything to be seen in Norfolk.*

"Farms are of various sizes from 100*l.* to 500*l.* a-year, and the rents of two sorts; the poor sheep-walk sands run at 4*s.* or 5*s.* an acre, but the better kind from 14*s.* to 20*s.*, in general about 16*s.* Their courses in the good sands are—1, carrots; 2, turnips; 3, barley; 4, beans; 5, wheat: this is an excellent one. 1, turnips; 2, barley; 3, clover; 4, wheat; 5, beans; 6, barley: another admirable course. At other times they drop the fifth and sixth crops, stopping at the fourth. Peas are sometimes used instead of the beans, and at others added after the barley as a seventh crop. It is a universal rule with them never to let wheat, barley, or oats come twice together, and they adhere to it very strictly. They plough the clover-land but once for wheat, but the bean-stubbles twice or thrice if wanting. If the crop happens to be weedy they hand-hoe it. The average crop 4 quarters per acre. They plough three times for barley, and reckon the mean crop at 5½ quarters; it rises very often to 6 and 7. When they sow oats they never get less than 5 quarters. Of peas their culture is extremely perfect; they plough from once to three times for them, generally drill them, and never omit keeping them clean by hand-hoeing, from one to three hoeings, as the weeds happen to arise; the average crop about 3½ quarters. Beans they are equally attentive to; they generally dibble them in rows equally distant, 16 or 18 inches asunder. The setting costs 3*s.* 6*d.* an acre; they never fail hand-hoeing twice, at the expense of 8*s.* an acre. They use the horse-bean, and also many Windsor ticks. Of the former sort their crops rise from 5 quarters to 7½, and this upon sand! Such are the effects of good culture! They get 4 or 5 quarters of the Windsor bean, and sell them from 40*s.* to 3*l.* a quarter. This husbandry of beans and peas is nowhere excelled.

"They always hand-hoe their turnips twice, and feed them on the land with sheep and cattle.

"Carrots are a crop that does them honour. They sow them to choose on their rich deep sand.

"They plough the stubble but once for carrots, holding that better than giving any previous tillage. About old Lady-day they trench-plough with two ploughs in the same furrow, the first with three horses and the last with two, getting a foot depth; they then immediately harrow in the seed without any manuring. I inquired particularly into the failures of the crop; they said that if the seed was good, carrots never failed; when once they came up they were sure. They never omit hand-hoeing them thrice, at the expense (the three times) of from 16*s.*

to a guinea an acre. The hoe they use at first is not above four inches wide, but they leave them at least a foot asunder.

"They begin to take up about Michaelmas with three-pronged forks, and, except having a small store beforehand in case of hard frosts, always take up as they are wanted. The carrot-tops wither and rot upon the land, but no frosts affect the roots; leaving them in the ground renders it necessary to sow turnips after: average crop, 698 bushels. They sell at 6*d.* a bushel, the crop, therefore, pays 17*l.* 9*s.* an acre; but I have already remarked they are worth 1*s.* for fattening cattle.

"They give large quantities to their horses; after washing clean, they are cut into the chaff; they allow a bushel per horse per day, and give no corn at all, yet their horses are constantly worked; but on carrots they will do as much work as upon any food. They likewise feed their hogs on them, and fatten many completely. No food does better for swine in general.

"In their tillage they plough with but two horses, and break up their stubbles at Michaelmas;\* at first ploughing they do only an acre a day, but afterwards 1½ or 2. They never keep their horses in the stable of nights, but turn them loose into the farm-yards.

"The breed of horses peculiar to this county is one of the greatest curiosities in it; I never yet saw anything that are comparable to them in shape, or the amazing power they have in drawing. They are called the sorrel breed, the colour a bay sorrel; the form that of the true round barrel, remarkably short, and the legs the same, and lower over the forehead than in any part of the back, which they reckon here a point of consequence. They sell at surprising rates: the good geldings or mares at from 35 to 60 guineas each, and small ones of 8, 9, or 10 years old at 20*l.*, but none of them are very large. The work they will do is extraordinary, being beyond comparison stronger and hardier than any of the great black breeds of Flanders, Northamptonshire, or Yorkshire. They are all taught with very great care to draw in concert, and many farmers are so attentive to this point that they have teams, every horse of which will fall on his knees at the word of command twenty times running in the full drawing attitude, and all at the same moment, but without exerting any strength, till a variation in the word orders them to give all their strength, and then they will carry out amazing weights. It is common to draw team against team for high wagers. I was

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\* In 1770 we see the present system of breaking up stubbles in the autumn adopted by the farmers of this district—a system so highly spoken of by Mr. Pusey in 1848, and recommended for more general adoption. See *Journal of the Royal Agricultural Society*, vol. viii. pt. ii. p. 570.—H. R.

assured by many people here that 4 good horses in a narrow-wheeled waggon would, without any hurt or mischief from overworking, carry 30 sacks of wheat, each 4 bushels (near 9 gallons measure), 30 miles, if proper fair time was given them. A waggon weighs about 25 cwt.; this weight, therefore, is very near 5 tons, and, let me add, they have not a turnpike near them. One might venture to assert that there are not 4 great black horses in England that would do this.

"Another most uncommon circumstance in the husbandry of this county is the use of a manure peculiar to them, which they call *crag*. It is found in almost all the hills and higher lands in the county, at various depths, sometimes only 2 or 3 feet from the surface, and it lies in a deeper stratum than they find necessary to dig. It appears to be totally composed of shells crumbled into powder; many are found in it of their entire form, particularly mussels; the colour of it a mixture of white and red. I brought away half a bushel, and have since tried it in strong vinegar, but it has not the least effervescence nor any ebullition: and yet it undoubtedly enriches the soil far more than any marl, for the farmers here lay on but 10 or 12 cart-loads an acre, and the effect is amazingly great; with this uncommon circumstance the soil is ever after greatly the better for it; nor do they in 12 or 15 years, as is common with such small quantities of marl, find the benefit declining fast. But there is a strong notion among them that the land can be *cragged* but once; if it is afterwards repeated, no advantage is found from it. This part of my intelligence I doubt very much, and especially as they find it very advantageous to form composts of *crag* and dung, which they practise much, carting the dung to the *crag*-pits, and there making the compost-heaps, turning it over twice, and sometimes thrice. The redder the *crag* is the better they reckon it. The effect of it is so great that, on breaking up the poor heaths of this county, they have had a succession of exceedingly fine crops of all sorts from such parts as they have manured with it, while at the same time other parts unmanured have scarcely yielded the seed again. All the rich enclosures of this country have been *cragged*. The farmers here are very attentive to all sorts of manures; they raise large quantities of farm-yard manure, and cart it all on to heaps and mix it either with *crag* or virgin mould, and this universally.

"They turn over and mix their heaps well together before they spread them on the land; they chop their stubbles, stack their hay at home,\* and fold their sheep constantly.

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\* The Lincoln practice of storing and consuming the hay in the meadows where grown, before noticed and condemned by Arthur Young.



" Upon the whole, this corner of Suffolk is to be recommended for practising much better husbandry, all things considered, than any other tract of country with which I am acquainted.

" Their crag-husbandry, their culture of carrots, their breed of horses, are circumstances peculiar, nowhere else to be seen. Their management of the pea and bean crop is much more masterly than anything met with in most parts of the kingdom. Their courses of crops are unexceptionable; in a word, they exert every effect of good husbandry to command success. They enjoy it, and well deserve the fruit of their labours. That of Norfolk is justly famous; but, everything considered, it must undoubtedly yield to the more garden-like culture of this county: their crops are far superior to anything in the neighbouring county. Flanders has long been mentioned as the most perfectly cultivated country in Europe. What the soil is I know not, but I will venture to assert that, soil equal, no Flanders husbandry can exceed the above described.

" From Woodbridge to Ipswich the country is various, but much of it not cultivated so well as what I have passed. It lets from 10*s.* to 16*s.* an acre.

" The husbandry in the neighbourhood of Ipswich is in general very good; about Bramford farms rise from 50*l.* to 250*l.* a year, the average from 80*l.* to 120*l.* The soil in some places is all strong clay, in others good loams; much gravelly loam, equally good for both turnips and wheat; lets from 10*s.* to 15*s.* an acre, average 12*s.* 6*d.*; the rents from hence to Hadleigh about 13*s.* The course of crops—1, turnips; 2, barley; 3, clover, one year; 4, wheat; 5, peas or beans: and 1, turnips; 2, barley; 3, clover; 4, wheat; 5, oats. This addition of oats is bad. Upon the clay soils it is—1, fallow; 2, barley; 3, clover; 4, wheat; 5, beans; 6, barley. Admirable! no course can exceed this.

" They plough but once for wheat, sow 2 bushels, and get 26 bushels on an average. For barley they stir three or four times, sow 3 bushels per acre, and get 4 quarters on an average. They plough but once for oats, sow 4 bushels, and reckon the mean product at 4½ quarters. They sometimes sow cole-seed for seed, and never fail of getting fine wheat after it. They give from 4 to 6 earths for turnips, always hoe them twice, feed them on the land with sheep or fattening oxen. They mow some of their clover for hay, and some they feed the first growth and mow the second for seed. They never fail of great crops of wheat after mown clover, but they dung the stubble. In respect to manuring they are excellent farmers; they form composts with all their farm-yard dung, mixing it well with what they call chalk, but which I found on trial to be an excellent marl. They put about a third part of chalk. Some farmers have limed their land,

and with good success. All chop their stubbles and stack their hay at home. All the way from Ipswich to Shotley, and so on to Manningtree, through the hundred of Samford, they are admirable husbandmen, and have excellent land to work on; they use great quantities of sea-ooze, and find it of great use, particularly in forming composts with their farm-yard dung, which, when well mixed together, they spread on their light lands. They form these heaps from the sea, and their yards in spring, and mix them well together through the summer for spreading on the clover lays for wheat. All wheat throughout this country that is weedy is as regularly hand-hoed as their turnips; the price 6s. an acre. They also hand-hoe all their beans, and never fail of sowing wheat after them. About Walton and Felixstow the soil is remarkably rich. Their common course is—1, beans; 2, wheat; and so on for ever."

Nathaniel Acton, Esq., of Bramford, is mentioned as an experimental farmer of that day, 1770. He finds by comparative trials that carrots, "not packed close together, after being well dried, were apt to rot; but all that were dry and close-laid *kept perfectly sound*." His cultivation for carrots was trench-ploughing: the carrot-seed harrowed in in March without manuring; the cost of hand-hoeing three times 30s., and of taking up 20s. an acre. Respecting the produce, "Mr. Acton has found but little variation; he has had them accurately measured, and finds that the quantity is 6 bushels per rod, or 960 per acre: these, at 8d. a bushel—the Bramford price—come to 32l. But I beg leave once more to observe that I have found carrots to be worth 1s. a bushel in feeding cattle,\* at which price these crops have been worth 48l. an acre. But whether the value is 24l., 32l., or 48l. is not of much consequence; for, take the lowest price, and you will find no crop that British fields produce equally profitable."

Mr. Acton also cultivated lucerne; and Mr. Young mentions his "drilling lucerne in July, and in a month it was 12 inches high."

"Mr. Acton's common husbandry is excellent, and his crops good. This course of crops is—1, turnips, well hoed twice, and worth 35s. an acre; 2, barley, 5 quarters an acre; 3 Clover, which yields 4½ tons of hay at two mowings; 4, wheat on one ploughing, always hand-hoed, at the expense of 6s. an acre—the produce 4 quarters per acre.

"He manures his fields richly: uses a clayey marl, very rich, if we may judge from the strong effervescence with acids. He lays from 50 to 90 loads an acre; the strangest effect of it is

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\* This is the old heaped bushel, three of which equal four imperial bushels of the present day.—H. R.

clearing the land from all weeds, which it does in an uncommon manner: nothing destroys poppies more. He makes composts of potash, horse-dung, and turf, which he mixes well together, and finds it a great improvement. The potash 12s. per 70 bushels. He lays on 15 loads an acre of this compost. Covered drains this gentleman has made in his wet fields with very great success; he has found the value of the land doubled by their means. Before they were made it was in vain to spread any manure, the effect was so trifling, but since the draining every spoonful takes effect.

"From Bramford to Hadleigh the soil is heavier than around Ipswich; they have not the command of turnips. About Hadleigh is much sandy loam, called woodcock land; lets on a medium at 15s. an acre, poor-rates are 3s. in the pound more, and tithe 4s. an acre. The country from hence to Lavenham runs at 12s. an acre, to Stowmarket 10s. 6d., and to Colchester 14s. Farms here rise from 40l. to 300l. a year. Their course of crops is 1, turnips; 2, barley; 3, clover, one or two years; 4, wheat. The produce of wheat, 4 quarters per acre; of barley and oats, 4 quarters 2 bushels; of peas, 2½ quarters; of beans, the same.

"Clover they mow once for hay, and get 2 tons an acre. Their turnips are worth from 1 guinea to 3: average 1l. 11s. 6d.

"They feed much clover with hogs, which they find a very profitable application of it. Many of their turnips they apply to fattening beasts, Scotch cattle, and also the Yorkshire long and short horned. They give from 7l. to 9l. in August, turn them into stubbles, and then into turnips in the field.

"There are large tracts of rich meadow-land that let to 35s. an acre; they apply it to grazing and mowing, 2 acres will carry 3 cows through the summer; the crops of hay 2 tons an acre. A good cow will give 8 or 9 lbs. of butter a week. Their principal husbandry is to buy wether-lambs in August, which they turn into their stubbles; then they put them to turnips, making them follow the fattening beasts. In the spring they turn them into the clovers, and keep them there till fat, which will be in July or August. They always double their money, and sometimes do more.

"In tillage they reckon 7 horses necessary for 100 acres of arable land; they use 3 in a plough, in light work but 2, and do an acre a day, the depth 5 to 7 inches, and generally plough up their stubbles before Christmas. Wheel-ploughs only used. They reckon 500l. necessary for stocking a farm of 100l. a year. The employment of the poor here is the woollen manufacture;\*

\* Only a few hundred spinners employed in the county now, *i. e.* 1848.  
—H. R.

many spinners and combers, the latter earn 8s. or 9s. a week, the spinners 4d. a day. All drink tea, many twice a day.

"*Labour.*—In harvest, 2s. a day and beer; in hay-time 1s. 6d. and ditto; in winter 1s. 2d. Reaping 4s. an acre; mowing, making, and cocking grass for hay, 4s. an acre. Hoeing turnips 4s. and 2s. Threshing wheat 2s. 4d. a quarter; ditto barley and oats 1s. a quarter. Headmen's wages 10l. to 10l. 10s.; next ditto 7l.; lads 3l.; a dairy-maid 3l.; other maids 2l. 10s.

"*Provisions.*—Women will not work in harvest, only glean. Bread 1½d. per lb., cheese 4d., butter 9d. per 20 oz., beef 3½d., mutton 4d., veal 3½d., pork 4d., milk ½d. a pint, potatoes 4d. a peck; labourer's house-rent 40s., ditto firing 30s.

"The particulars of a farm as follows:—300 acres in all, 250 arable, 50 meadow, 200l. rent; 16 horses, 6 cows, 18 young cattle, 40 swine; 62 acres turnips, 62 barley, 62 clover, 62 wheat; 4 men, 1 boy, 2 maids, 4 labourers.

"All this country has been chalked: the quantity generally 10 waggon-loads an acre. But now they mix it with farm-yard dung, and reckon this management the best husbandry.

"The country is pretty rich and well cultivated to Lavenham, and so on to Hasted (Halstead), about which place the soil is chiefly clay, or clayey loam of a loose nature, hollow and damp; lets from 9s. to 20s. an acre, average about 14s. 6d. Farms rise from 20l. to 130l. a year. The course of crops on their stiff land is—1, fallow; 2, wheat; 3, barley; and a vile one it is. On the lighter land—1, turnips; 2, barley; 3, clover; 4, wheat—which is far different. They plough five or six times for wheat, sow 2 bushels, and reap on a medium 2½ quarters. For barley they stir two or three times, sow 4 bushels, and 3 quarters the average crop. For oats they plough but once, sow 4 bushels, and reckon the mean produce 3½ quarters.

"They plough but once for peas, sow 2 bushels an acre, very seldom hoe them; the crop 2½ quarters.

"For turnips they plough five or six times, hand-hoe twice, and reckon the mean value 40s. an acre; use them for sheep, and some few for fattening beasts.

"Clover they both feed and mow for hay, get from 20 to 30 cwt. an acre at one cutting; some they seed, get 4 bushels on an average, sometimes 8. They reckon the wheat as good after seed as hay, but rather better after feeding than either, but never so clean.

"Folding sheep is never practised; but all the farmers chop their stubbles and stack their hay at home, and some bring dung from Bury.

"Many of them are very good farmers in the article of draining.\*

\* This, the S.W. corner of Suffolk, is probably where thorough draining

They make all covered drains 32 inches deep, 2½ inches wide at bottom, and a spit at top; the price of digging and filling from 3d. to 4d. a rod, but of late years they have got into the way of ploughing the first spit by going a bout or two with the common plough, and then digging one or two spits, in which manner they pay only 2d. a rod. They fill first with bushes, and then with wheat-stubble. The best grass-land lets at 20s. an acre; they apply it all to the dairy, and reckon that an acre will carry a cow through the summer. They breed a little mongrel sort: they give on an average 4 gallons of milk a day, but good ones 8 gallons; annual product 5l. They understand very well the management of hogs depending on cows, for they keep at the rate of 2 sows and all the pigs bred by them to every 10 cows. The winter food of their cows is straw, with some hay and turnips at calving.

"Their flocks rise from 20 to 80; the most common sheep-husbandry is to buy old crones, as they call them, that is, old ewes, in September, at from 5l. to 8l. a score. These they keep a year, and sell the fat from 16l. to 19l. a score. In their tillage they reckon 6 horses necessary to 100 acres of ploughed ground, use 2 in a plough, and do an acre a-day. The annual expense of a horse they reckon at 7l. They do not break up their stubbles till after barley-sowing. The price of ploughing 4s. an acre; the depth 4 or 5 inches. They all cut straw into chaff. They calculate 400l. to be requisite for stocking a farm of 100l. a year. Land sells at thirty years purchase. Poor-rates 3s. in the pound. The employment, spinning wool, at which a woman earns 4d. a-day. They all drink tea.\* The farmers carry their corn 25 miles.

"*The Particulars of Farms*.—160 acres in all: 120 arable, 40 grass; 108l. rent; 8 horses, 10 cows, 6 young cattle, 60 sheep; 1 man, 1 boy, 1 maid, 3 labourers: 24 acres wheat, 24 barley, 24 fallow, 24 clover, 10 turnips, 14 peas and beans.

"Another, 150 acres in all: 75 arable, 75 grass; 120l. rent; 6 horses, 20 cows, 5 young cattle, 50 sheep; 2 maids, 1 boy, 3 labourers, 2 men; 20 acres wheat, 20 fallow, 10 barley, 10 clover, 5 turnips, 10 oats.

"From Hadleigh another way I took the road to Manningtree, through a country rich and very well cultivated. In that part, towards Hadleigh, the husbandry is pretty much the same as in the account I gave above; about Manningtree it resembles the methods around Ipswich. They use much rich marl from Kent, which is brought by shipping; they call it chalk."

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was first practised, if we may judge from the above, and from the extract from Professor Bradley's work given at p. 50, and also from the evidence of Mr. Jonas.—*Journal, R. A. S. E.*, vol. iv. p. 32.—H. R.

\* Some old-fashioned people are in the habit of drinking tea three times a day, viz., breakfast, dinner, and tea.—H. R., 1848.

## SUMMARY.\*

In this Report—'Farmer's Tour through the East of England, 1770'—we find that many of our so-called modern methods were in use more than three-quarters of a century ago, and, recollect, not even then as new. In the Eastern sands the culture of carrots for horses, swine, bullocks, cows, &c., was the same as at present; the quantity grown and value of the crop being great. We see crag used as a manure, both by itself and in composts; the drill and hoeing management of beans and peas; and turnips and wheat also kept clean by hoeing. We find the horses equally, as now, celebrated, and that two horses only were universally used throughout the county, except in a few places between Bramford and Hadleigh, where, although two horses were used in light ploughing, three were used in the deepest ploughings on the heaviest lands. We find the same mode of keeping the horses in well-littered yards and open sheds containing a manger and racks. The horses in some parts fed entirely on carrots, and the custom of cutting straw into chaff universal in the county. The docility of the horses is equally remarkable. The above alludes to the part of the county near Woodbridge. In Sandford hundred sea-ooze, in other parts marl, chalk, clay, and in one instance potash, are used either by themselves or in composts. As to machines much could not be expected then, but we see that a common blacksmith, John Brand, of Lawford (by all accounts a Suffolk man, though living in an Essex village), had invented the first iron swing-plough, and also ploughs for ploughing from 1 to 2 feet deep, and many other tools, including a stubble horse-rake on wheels and a hand-mill for grinding wheat. We also find the Suffolk plough-head (cathead or copse) was far superior to those used in any other part of the country.

In draining we see exactly the present (1848) method used. See p. 18.

We see lucerne grown with very great success in Suffolk (by Acton and Tanner), both in drills and broadcast, and capital hay made of it, which Arbuthnot says ought to be laid up green—not wet—as the sap improves, and the consequent heating prevents it being so sticky.

The practice "between Bramford and Hadleigh" of turning hogs loose into clover and bullocks into turnips, appears wasteful and bad husbandry; but in the latter case they had sheep to follow and eat the remnants.

The fondness of the people for tea and the great use of it

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\* Subjects are alluded to in the Summary that have not been given in the extract.

(even more general than at present) is also a curious circumstance. Was tea less taxed and cheaper then? Thus we find the paupers in Nacton Hundred house preferring tea and bread and butter to anything else for dinner, and spending all their little earnings upon it. "Peas-porridge used to be the dinner on Friday and Saturday, but they petitioned for bread and butter, because they had tea with it; being permitted to spend 1s. of what they earned, they lay it all out in tea and sugar to drink with their bread-and-butter dinners." "All drink tea, many of them thrice a day:" he is here speaking more particularly of the poorer classes of Suffolk. How highly Young thought of the state of cultivation in many parts of Suffolk, particularly near Woodbridge and in Sandford hundred, appears from the following:—"These parishes (near Woodbridge) abound in several instances with the best husbandry in Britain. In many instances it will surprise a stranger more than anything in Norfolk. Upon the whole, this corner of Suffolk is to be recommended for practising much better husbandry, all things considered, than any other tract of country with which I am acquainted." For the state of agriculture in 1800, Young's Suffolk Report may be advantageously consulted. Mr. C. Poppy has kindly forwarded me the following account of the gradual progress of improvement from that date to the present; and J. Peirson, Esq., a comparative view of 1793, 1803, and 1846:—

"New systems and the cultivation of new produce extend slowly; there are difficulties existing generally, which prevent farmers from adopting new systems, or cultivating newly introduced roots and herbage. The Rev. H. Close, of Trimley, near Ipswich, was, I believe, the first to enter upon the drill and horse-hoeing husbandry in this county, on his farm at Occold. This had been chiefly a pasture farm, the farm-house and buildings at one corner; the house he sold, pulled down the buildings, and built a good new house and premises in the centre. The land being newly broken up, and the remainder of the farm not difficult to till, the drill and horse-hoeing system could be carried on without difficulty. A small seed was used, and great crops were reported, and this led many to adopt the system on mixed soils. Obstacles, however, existed to prevent the new system from being adopted on heavy land, and most farmers suspected that the large crops obtained were more from the freshness of the land and expensive farming than from the use of the drill and horse-hoe.

"*New Era.*—As old farmers dropped off, young ones adopted a new system of farming; some who were permitted broke up a portion of the old cow-pastures, others grazed beasts and sheep, and others bought in crones and bred lambs. On Wetheringsett

Lodge farm 100 cows had been kept, but Mr. Press, who Mr. Young mentions as having erected a threshing-machine, broke up most of the pastures, and adopted the *new* husbandry; still this system extended slowly; there were obstacles not easily overcome; many tried the drill system and gave it up; the drills and horse-hoes were very defective, and spring tillage of fallows and turnip-lands did not suit the drill-system, and unless the lands were ploughed in spring they did not lay light enough for barley. The successful putting-in of spring-corn without ploughing of Mr. Edwards, of Ashbocking, induced Mr. Simpson, of Witenesham, to adopt the plan; but Mr. Edwards' was deep-stapled tender land compared to most other districts, and the 700 acres occupied by Mr. Simpson were a similar soil, and chief of the arable fresh-broken up and all drained. Thus on these farms the implements *then in use* were sufficient to stir the soil deep enough for spring-corn, and to destroy the black grass and charlock which then abounded.

"Hayward's extirpator had been invented previous to 1804, and this enabled the occupiers of old arable land to stir their fallows in spring deep enough to dispense with ploughing. About 1810 a cheap iron triangular scarifier was invented suitable for the use of the small farmers, and from that time ploughing in the spring was *generally* given up. There are districts, however, where ploughing in the spring for barley is still practised.

"Barley was a precarious crop on tenacious soils, whilst spring-ploughing was practised, from not vegetating regularly. It frequently was unfit for malting, a great portion light dross, and short crop, and thus much fallow-wheat was grown, and but rarely now. A small breadth is occasionally sown on land where beet and early-fed turnips were grown, when a favourable season occurs, but not enough to materially alter the average growth.

"*Former Cow District.*\*—Mr. Young stated that 40,000 firkins

\* The following will show the price of butter per firkin from 1787 to 1819. The flet cheese was generally sold with the butter, at the same price per wey (256 lbs.) as the butter was per firkin. The farmer who gave me this account left off keeping cows in 1819. The price of butter fell after the peace, the high price of 1818 being caused by its being a year of very short produce.

| £. s. d.      | £. s. d.      | £. s. d.      | £. s. d.      |
|---------------|---------------|---------------|---------------|
| 1787 . 1 15 0 | 1796 . 2 4 6  | 1804 . 2 16 0 | 1812 . 3 15 0 |
| 1788 . 1 11 6 | 1797 . 2 3 0  | 1805 . 2 8 0  | 1813 . 3 8 0  |
| 1789 . 1 10 0 | 1798 . 2 2 0  | 1806 . 2 16 0 | 1814 . 3 3 0  |
| 1790 . 1 12 6 | 1799 . 2 10 0 | 1807 . 3 3 0  | 1815 . 3 0 0  |
| 1791 . 1 16 0 | 1800 . 3 3 6  | 1808 . 3 9 0  | 1816 . 2 9 0  |
| 1792 . 1 5 6  | 1801 . 2 10 0 | 1809 . —      | 1817 . 2 9 0  |
| 1793 . 2 2 0  | 1802 . 3 0 0  | 1810 . 3 2 0  | 1818 . 4 0 0  |
| 1794 . 2 1 0  | 1803 . 3 10 0 | 1811 . 3 10 0 | 1819 . 3 3 0  |
| 1795 . 2 4 0  |               |               |               |



of butter were annually sent to London from this district; a great quantity was sent to Norwich and Yarmouth weekly, and numbers of waggon-loads of butter and cheese were sent to St. Faith's fair (Norwich) until dairying was given up: thus with supplying the home demand an immense number of cows must have been kept, and a great breadth of land required to feed them. Very few cows are now kept, and an immense quantity of butter and cheese is imported to supply the demand and consumption in the county.

*"Transition from Pasture to Arable.*—The number of cows in this district had been greatly reduced in 1804, and the high price of corn and meat led to reducing the cow-stock more rapidly, and more land was broken up, and this system progressed rapidly till 1819. The depreciation in the price of produce from 1819 to 1823 induced some landowners to admit of more pasture being broken up, and thus the cow-stock was reduced more rapidly. Up to 1804 the early calves were fatted, and immense numbers were packed for London, and the late calves were collected and great droves taken every week to Colchester and sold to the Essex farmers for sucklers, and the progress of the decline of dairying was seen from year to year by the less and less numbers of these calves, until so few could be collected that the trade was given up; since which a great number of calves are brought from London and purchased for weaning. Suffolk calves are sold at 30s. to wean, and short horned at 50s.

*"Progress and Effect of Cultivation.*—As pastures were broken up and the old wide borders of arable land were cleared, and road-side wastes and commons were inclosed and cultivated, the demand for labour increased, and as the demand for labour increased the population increased. From 1801 to 1841 the population increased 50 per cent., and it is supposed that it has increased more rapidly since, and the consequence has been that where a great depreciation in the price of produce occurred, many labourers were not fully employed.

*"Inclosures since 1804.*—Elmswell Green near Woolpit 700 or 800 acres, Babergh Heath 300 acres, Alwood Green (Finningham) 400 acres, Broom Common 300 acres, Westerfield Green 100 acres, and numbers of other smaller commons and strips of waste; and Weybread and Woolpit Warrens have been inclosed and cultivated, and no great extent of commons and heaths remains that is worth cultivating.

*"Marling.*—Much marling has also been done since 1804. Recently a considerable extent of land has been covered with marl or loam at Shotsham and near by, and in the parish of Capel (Sandland district) where great quantities of marsh earth were carted on the land in 1843; 1844 being a dry summer, the marsh earth seemed to cause the land to scald more than where none was laid. Babergh Heath in West Suffolk was covered with marl

or loam before it was broken up, and good crops of turnips and corn have since been grown.

*"Introduction of new Crops.*—The first Swedish turnips sown in this county were sown on Eye Park farm in 1804 or 1805; they were sown in July from not understanding their cultivation. They proved very small, and were given up, and I saw no more grown till about 1810 or 1812, when they were being grown on many farms where a turnip-soil existed. Few could obtain a plant on heavy lands for some years after, nor with any certainty until the nature and habits of the fly were found out, since which few fail of plant except from drought.

*"Mangold-wurzel* was, I believe, first grown in Suffolk by a Mr. Collett, of Clopton, near Woodbridge, about forty years since. It was a good crop and harvested in due time, but being stored in a shed the roots were heated and all spoiled, and we heard of no more being grown for two or three years; and it was several years before it was extensively grown.

*"White carrots* were introduced some ten years since. They are in some cases substituted for red carrots on the sandy soils, and are being grown to some extent on heavy lands. They are found to be far more productive than red carrots, and less laxative for horses, beasts, and swine stock.

*"Mustard* has been grown for seed, for feed, and ploughing in for manure, occasionally, for twenty years, and continually, to protect the turnip-plant from the fly.

*"Gold of Pleasure* is grown by a few farmers for seed and to fatten stock.

*"Flax* is being grown for the seed and fibre to some extent.

*"Millet* I have grown, but have not well succeeded with; first sowing too soon, afterwards by being supplied with bad seed, and the last two years from sowing too late and drought occurring. It is the best autumn-food for cows I ever used, and appears equally so after producing seed. There are several varieties, but the African is the best. Five quarters per acre have been grown abroad.

*"Chicory.*—A company has hired a large farm (at Trimley) to grow and manufacture chicory. They grew nearly 200 acres in 1845, but only 100 in 1846, having found a difficulty, I was informed, in harvesting and manufacturing so large a quantity. Two gentlemen in this district grow a large breadth of chicory.

*"In summing up* the improvements in cultivation, it may be stated that a great deal more hand labour is employed in forking out spear-grass than formerly, and the scarifiers enable farmers to clean their lands much sooner. Manure is frequently drilled with the turnip-seed, always if no other manure is applied, and frequently in addition; and fatting sheep are fed with oil-cake, corn, and cut chaff whilst consuming the turnips. These are the chief improvements made of late years in fallowing and turnip

husbandry, but slicing the turnips eke out the feed and save much waste. In 1804 and many years afterwards there was much smut and pepper-kernels in the wheat, but such are rarely met with now. Most farmers, I believe, dress with vitriol, but still a chance bladder is seen. Dipping and dressing with dry arsenic is the most certain remedy, and the cheapest and least trouble.

"Implements and machines are greatly improved. Ransome's two-wheeled plough enables farmers to plough up their seed and tare land where fed in dry weather, and also their stubbles after harvest for rye, tares, and in preparation for beet and carrots.

"The newly invented horse-hoes and Biddle's scarifier assist in enabling farmers to clean their lands, and enable them to grow the newly introduced roots and herbage.

"The greatly improved Suffolk drills also aid in securing a plant of turnips and in drilling hilly lands, and the improved turnip-cutters, chaff-engines, &c. in economizing food.

"Science also has assisted us in adopting specific manures for different crops; but until the Royal Agricultural Society was established we were continually purchasing defective implements and machines, and some have so frequently given up their old machines and purchased improved ones, that they have sacrificed much money, and in none, I think, so much as by threshing-machines.

"A great stimulus to improvement has taken place since the tithes were commuted; lands subject to a modus have been and are being broken up, woods are being cleared, and in many cases a great outlay of capital has been made to improve lands permanently, which would not otherwise have occurred.

"The vast quantity of corn raised now, compared to what there was in 1790 when dairying was in full operation, has caused the consumption of iron, leather, and every perishable article that the arable farmer consumes to be immensely increased. The number of farm tradesmen must be trebled, and thus the other trades have increased. Every class is increased except farmers, and the number of farmers no doubt is reduced."

*Suffolk Farming in 1803, as by Arthur Young's Report, compared with the Present Condition, 1846.*

1803. "The maritime district of Suffolk I take to be one of the best cultivated in England."

1846. The same remark will apply now.

1803. "He complains of the bad manner of building cottages."

1846. They are often badly built now, only one bed-room being allotted for man, wife, and family.

1803. "The Norfolk wheel-plough and the little light swing are the common implements. The latter is a good tool for depths not exceeding 4 inches."

1846. Now the common cast-iron foot ploughs are used for the heavy land, and wheel-ploughs for light soils; both are capable of ploughing any depth, up to 12 inches.
1803. "Suffolk must be reckoned amongst the earliest enclosed of the English counties; but there are many large tracts yet open."
1846. These have been nearly all enclosed.
1803. "On wet lands the 3-foot Essex ridge of two bouts is most common, but farmers are beginning to adopt their stretches to their drilling-machines."
1846. Nearly all stretches; only a small district near Clare and Haverhill adhere to the ridge system.
1803. "It is high time that mankind should be well persuaded that the right quantity of cattle and sheep cannot be kept on a farm if the fallows of the old system be not made to contribute to their support."
1846. We do make them; there is scarcely any exception.
1803. "In the neighbourhood of Debenham and Earl Soham there are fewer cows than were kept, by a thousand, ten years ago."
1846. The still further decrease in the number of cows kept in this district is enormous. At the former period this district furnished London with large supplies of butter, which was considered the first in quality, and the north of England with cheese by ship-loads. Now it scarcely supplies the neighbourhood. The writer was obliged to buy Dorsetshire butter in November last, because he could not obtain Suffolk at his market-town. Very few cheeses are now made—not even sufficient for home consumption.
1803. "Wheat: quantity of seed. 2 bushels per acre are the common allowance; some will sow a peck more, and, if late in the season, even to 3 bushels. Some, on good land, will trust to 7 pecks; but even in dibbling that quantity is often put in."
1846. 4 pecks of seed-wheat are often dibbled per acre; 5, 6, or 7 pecks are drilled. A less quantity of seed is needed in consequence of thorough draining and high manuring.
1793. Drilling just introduced.
1803. "For many years the farmers held out, condemning the practice of drilling. They are now converted, and this husbandry spreads rapidly."
1846. Every farmer drills now, and nearly all possess a drill of their own.
1793. "I do not know of any threshing-machine in this county."
1803. "A noble change has taken place in this respect, for there are at present above 20."
1846. I think every large farmer now has one, besides very many in every district that can be hired by the smaller occupier.
1803. "The practice of not ploughing in the spring for spring corn is now beginning to be understood."
1846. For spring corn none plough if they can possibly avoid it.

1803. "Beans.—They are not generally cultivated in Suffolk."  
 1846. Now they are in very general cultivation.
1803. "They never dung for beans in Suffolk."  
 1846. Now they always do manure for beans.
1793. "The quantity of beans given to horses is not very considerable, and the consumption for hogs or fattening cattle still less."  
 1803. "In this respect the Suffolk farmers have been advancing; many beasts are now stall-fed with bean-meal."  
 1846. Beans are very extensively used for cart-horses, and also for fattening cattle.
1803. "Peas should always be dibbled."  
 1846. Peas should always be drilled.
1803. "Clover, in common management, is grazed in the fields by cart-horses, but sometimes made into stover."  
 1846. It is now always made into stover.
1803. "Turnips.—The cultivation of this root has changed the face of the poorer soils, and rendered them more productive to the landlord, the tenant, and the public. Where a farmer has no proper soil for turnips, I think it would be prudent to give up the winter-feeding of more cattle than his hay and straw will do for. Carting off is common, but the expense (allowing for the damage done to the succeeding crop) is too great, and I should never recommend the culture with that view."  
 1846. Thorough draining has obviated all these difficulties. The introduction of swedes has done much; but mangold-wurzel has entirely overcome them. Now we cart off early in the year, and plough our heavy land for the winter frost. Arthur Young never mentions swedes or mangold-wurzel—these are new introductions since his time, and are of incalculable value.
1803. "Hemp.—Finding the profit so great, I demanded why the culture did not increase rapidly? I was answered, that its coming in the midst of harvest was embarrassing, and that the attention it demanded in every stage of its progress was great, being liable to be spoiled if the utmost care was not perpetual. Hemp delights in *black rich mould—the richer and stronger it is the better.*"  
 1846. No hemp is grown now; and may not all these difficulties be applicable to the present attempt to introduce flax?
1803. "Suffolk is not famous for its grass lands, either in respect of its fertility or management."  
 1846. I fear this is true now, as to its management.
1803. "Draining began, from 20 to 26 inches deep."  
 1846. Drains 30 to 36 inches, and this year to 4 feet in depth.
1803. "Never let drains lie open any length of time, lest they should be injured by wet or frost."  
 1846. Mechi says, let them lie open that their sides may crack; better percolation.

1803. "The Norfolk sheep are most general; there are some South downs."
1846. The Southdowns are most general; there are a few Norfolks.
1803. "The best cart-horses were found some years ago upon the Sandlings south of Woodbridge and Orford."
1846. So it is now, as the prize-sheet of the Royal Agricultural Society of England can testify.
1803. "There is only one Agricultural Society, the Melford."
1846. Now there are several county societies in Suffolk, besides a great number of local farmers' clubs. The members of the latter assemble monthly to discuss practical subjects connected with agriculture.
1803. "Cost of labour on 100 acres of heavy land, 100*l*."
1846. Ditto ditto 150*l*.
1803. "Mr. Simpson feeds his cabbages and turnips early, so that he may plough his land up; but then, having no root in the spring, he feeds with beans."
1846. Now we have swedes and mangold-wurzel for the spring.
1803. "Complains that the arable land on wet soils was in too great proportion to the grass, so that it prevented the increase of grazing or cows, and consequent loss of production."
1846. I could mention one large farm with only 12 acres of pasture, upon which a greater quantity of all kinds of stock are kept than on many others with five times the proportion of grass. Thorough draining has completely altered this complaint of Arthur Young's, by allowing the farmer to grow roots.

*On the Tullian System, viz. Thin Sowing and Drilling, and the Influence it has had on the Agriculture of Suffolk.*

Tull's work, the 'Horse-hoeing Husbandry,' has probably had more effect in improving the agriculture of England than any other work: not that the work itself has been very extensively read, but that the practice of the principles originating therefrom has been gradually increasing and extending, till now it is almost universal in the eastern counties, as Suffolk and Norfolk, and almost equally so, as far as roots and legumes are concerned, in Scotland, and practised here and there, to a greater or less extent, in every county in England.

His principles were that of pulverizing the soil as much as possible before sowing, and keeping it well pulverized afterwards by repeated horse-hoeings. This hoeing was done with a kind of plough, first ploughing the soil away from the rows of plants, and then, after a short time, returning the soil. His lands were laid in ridges of 5 or 6 feet, and upon this he drilled one, two, or three rows, at about 7 inches apart when three, and 10 inches when only two rows. These narrow spaces were kept constantly

hand-hoed, and the wide intervals horse-hoed. He had contrived a drill with 11 coulter at  $3\frac{1}{2}$  inches apart, to drill three sorts of seed without mixing, and at various depths, viz. : barley 7 inches in the row and 4 inches deep; clover 3 inches above it in the same channel; and sainfoin between the rows of barley. But being convinced of the folly of such narrow spaces and of mixed crops, he demolished it. The drills he afterwards used were in principle much like those still in use by the Scotch, drilling only one or two, and at the most three rows; and, like him, they still use cavities in the surface of solid cylinders for feeding, instead of cups or brushes.

Tull's drills were drill-ploughs; and such drills were occasionally used in Suffolk before the Rev. James Cooke, of Heaton Norris, Lancashire, invented his drill, which was the original of the modern Suffolk one, and which has been carried to such perfection by Baldwin, Smyth, and Garrett (all Suffolk men), as to supersede all others, at least in the eastern and southern counties of England.

When Young made his tour in 1803, he found the drilling and horse-hoeing husbandry extensively practised for *all* crops, except carrots and clover, and this not on light land, but on strong land, where it had been thought impracticable. The custom of letting out drill-machines was even then in use. "Labourers buy drill-machines (Cook's), with which they go out drilling at 2s. an acre; some of them earn from 10*l.* to 20*l.* a year, and some more, by this practice" (p. 351). Mr. Young gives the names of some of the most noted drillers:—

Mr. Simpson, Witesham, 14 years; Duke of Grafton, Euston, 2 years; Rev. H. Hill, Buxhall, "many years." Has not had a summer fallow for 14 years. Mr. Press, Wetheringsett; Mr. Balls, Wenham; Mr. Spalding, Halesworth; Mr. Wells, Laxfield; Mr. Moore, Crow Hall, Debenham; Mr. Dove, Euston Hall, 12 or 14 years ago, beginning with a wheelbarrow-drill, then one with spiked wheels, which did well, but now with Mr. Cook's; Mr. Freeman, Aspal, 15 years, among the first drillers on strong land in Suffolk. Captain Wootton, 12 or 14 years, 5 pecks wheat per acre, 18-inch rows. Samuel Fiske, Esq., Woolpit; Mr. Thomas Rout, Onehouse, Stowmarket; Mr. Freeman, Buxhall; Mr. Thompson, Culpho; J. W. Theobalds, Esq., Clayton, 5 years. Rev. Mr. Freeland, Melton, near Woodbridge; — Studd, Esq., Melton; Mr. Cotton, Kesgrave; Mr. Fuller, Rushmere Heath, Ipswich; Mr. Chaplin, Nedging, near Hadley, 3 years. Sir William Rowley, Bart., Tendring Hall; Mr. Howlett, Westwood, near Southwold, 3 or 4 years. Earl of Albemarle, Eldon, on 4000 acres; Mr. Read, Darsham; Mr. Martin, Darsham, 6 years. Mr. T. Gooch, Darsham; Mr.

Coates, Sutton; Mr. Gross, Sutton; Mr. T. Waller, Sutton, 7 years. Mr. Mabson, Shottisham, 3 years.

But to show the extent Tull's principles were practised, let us enter more into particulars.

1st. In Arthur Young's time we find that Mr. Simpson of Witlesham, from a perusal of Mr. Tull's book, grew a six-acre field of wheat for many years two rows 9 inches apart on 5-foot ridges, horse-hoeing from and to the rows. At page 364 Mr. Young recommends drilling double rows of wheat 9 inches apart on 3-foot ridges, to be hoed by two horses, one walking in each furrow, and consequently moving with great regularity and steadiness; a scarifier in the centre of the beam for the 9-inch space, and two scuffling shares for the intervals. Here the principle of double rows still is kept up, though the ridge is much narrower, as it is in the next. Mr. Cotton, Kesgrave (light land), drills peas in double rows at  $3\frac{1}{2}$  and 12 to 13 inches interval, and horse-hoes. Mr. Simpson, Witlesham, grows cabbages, one row, on 5-foot 3-inch ridges, 2 feet from plant to plant. On the same width of land he drills two rows of turnips at 2 feet asunder.

*At present day.*—The double rows of wheat mentioned in a former part of this Report, the culture of two rows 8 inches apart of beans on 3-foot 6-inch ridges, and Mr. Downing's cabbage-culture, have in point of fact either originated or been improved from the Tullian husbandry.

The thin-sowing system of Messrs. Davis and Mechi is Tullian in every point, and as such we find it much practised in Suffolk in the time of Arthur Young, both in thin sowing—that is, the rows far apart—and thin seeding: thus several gentlemen, as Rev. H. Hill, Capt. Wootton, &c., were then drilling wheat at 18 inches. Mr. Hill advocated drilling as getting better crops, and saving at least half the seed; and a Mr. Rout (p. 382) drilled only 3 pecks an acre of wheat. Capt. Wootton drilled barley at 12 and 18 inches. Three acres of six-rowed barley, sown in December, fed 127 sheep five days in May, and produced, the 12-inch nearly 18½, and the 18-inch near 19 co. an acre. S. Fiske (p. 380) drilled wheat and oats at 12 inches. Thompson (p. 386) sows oats a co. an acre; and another gentleman barley, 5 pecks an acre.

But the resemblance between the practices of Mr. Davis and Mr. Simpson of Witlesham comes nearer still. Thus, in the 'Royal Agricultural Journal,' p. 351, vol. vii., Mr. Davis says, "I drill everything (except clover)—rye, tares, and cereal corn at 12 inches; beans, peas, and roots at 28 inches; at the rate of rye, 1½ bushel; oats, 2 bushels; peas, 2 bushels; wheat, 1 bushel." *Suffolk Report*, 1804, p. 354:—"Mr. Simpson drills and horse-hoes all his crops; drills all his white corn at 12 inches; peas, 18; beans, 18 to 24; and sows wheat, 1 bushel; barley, 6 to 7



pecks; oats, 2 bushels; peas, 2 bushels; beans, 6 to 7 pecks. All his manuring is with one-horse carts; and at Otley, where his implements are new, he has nothing else."

#### *Double-row Culture of Wheat.*

This practice,\* also a modified and improved form of Tull's system, owes its modern introduction to Kersey Cooper, Esq. (Steward to his Grace the Duke of Grafton, at Euston), who has kindly favoured me with the following description of his system:—

"Euston, June 3, 1848.

"DEAR SIR,—I beg to acknowledge your letter of the 31st ultimo, and it will afford me much pleasure in giving you any information I possess upon the double-row system of growing wheat. It is a plan that I have profitably pursued upon this occupation (which, as you are aware, is a light sand upon chalk) for the last seven years, and I tested its comparative produce with that sown on the usual system (of drills regularly 9 inches apart) for the first three years, and the result of these trials was highly satisfactory in favour of it.

"The result of two of the trials is shown in the following statement:—

#### *"First Trial.*

"20 rods of the double-row sowing, growing side by side of that drilled in equal distances of 9 inches apart—produced 1 coomb, 1 bushel,  $1\frac{1}{2}$  pecks, weighing 27 stone 13 lbs. Straw weighed 4 cwt. 2 qrs. 21 lbs.

20 rods of wheat, sown 9 inches regularly apart—produced 3 bushels,  $3\frac{1}{2}$  pecks, weighing 17 stone 10 lbs. Straw weighed 3 cwt. 3 qrs. 21 lbs.

#### *"Second Trial.*

"20 rods of double-row sowing—produced 1 coomb, 1 bushel,  $1\frac{1}{2}$  pecks, weighing 24 stone, 12 lbs. Straw weighed 4 cwt. 3 qrs. 18 lbs.

20 rods, of 9 inches apart—produced 1 coomb,  $\frac{1}{2}$  peck, weighing 19 stone, 1 lb. Straw weighed 3 cwt. 3 qrs. 1 lb.

"My plan of sowing is this:—to adjust the coulters on the beam of the drill to distances averaging 14 inches and 4 inches apart, thus:—

|     |   |        |     |   |        |     |   |        |     |   |
|-----|---|--------|-----|---|--------|-----|---|--------|-----|---|
| in. | 4 | 14 in. | in. | 4 | 14 in. | in. | 4 | 14 in. | in. | 4 |
|-----|---|--------|-----|---|--------|-----|---|--------|-----|---|

and I generally put in about 6 pecks of seed to the acre.

"I am a strong advocate for having the land properly prepared before growing wheat, as I attribute much of the injury done by wire-worms and other insects, in destroying the plant during a mild autumn, winter, or wet spring, to this circumstance.

"I like to plough my layers up *deep*, and as early after harvest as it is possible, having carted the manure, or *caked* them, during the summer, so as to encourage the growth of artificial grasses, and ploughing in all that is possible—the vegetable decomposition of which is particularly desirable to the wheat plant. I then employ a heavy drill-roller, drawn by *four horses*, which I am of opinion gives more solidity

\* Mentioned at p. 42 of Prize Report.

than a common roll of equal weight, with the advantage of producing a great quantity of mould, and which enables the wheat plant to be buried a good and regular depth. I prefer the first and second week in October for sowing upon this description of land—poor sand. My next process is rolling it with a common iron roller as early in the spring as the weather will admit, for I consider the frosts, in pulverizing the soil, loosens the earth from the roots of the plant, which the rolling again makes solid. I then use Garrett's horse-hoe, which I find an excellent implement for the purpose; and if between the narrow drills (which will sometimes be the case) there should be any poppies grown, a few children are employed to weed them out. The horse-hoe will do about 12 acres in ten hours, with two horses working five hours each. I generally horse-hoe three times; but seasons and circumstances must be the same guide here they are in all other branches of employment on a farm; but I have always found, both in hoeing wheat and turnips, the more hot and dry the weather was, the more essential benefit the plants derived from it.

“I am, &c.

“G. KERSEY COOPER.”

#### *Influence of the Flemings on Suffolk Agriculture.*

Suffolk being the nearest point to Flanders, and many cloth-workers and other Flemish emigrants having at various times settled in that county and Norfolk, there can be no doubt but that they have left many traces in the names of families, in words in common use, and in our agriculture. It would be difficult to trace names either of things or persons: the improvements they have made in our agriculture are more easily shown; but we must not forget that all these opinions are conjectural, and, although probable, many of them are by no means certain.

Hops, as I before observed, may be considered to have been brought over from Flanders, and probably about the same time, or shortly before, that the Flemish emigrants introduced the gillyflower, carnation, and rose of providence into Norfolk, viz. about 1567.

Carrots, as a farm crop, were probably brought into use by the Flemings, (from Norden's 'Surveyor's Dialogue' it appears that carrots were cultivated in the Sandlings two centuries ago,) and also the use of carrots as food for horses in winter. The driving two horses abreast in a plough, guiding them with a hempen cord, and the using a plough with only a single handle, may perhaps have been taken from the Flemish practice, as also may the feeding horses with chopped straw mixed with corn and beans, yet are equally likely to have been taught by experience. And that the Suffolk punch horse is an importation from Flanders, as some say, I think is extremely unlikely, almost the only resemblance being that of colour.

*3. Suffolk Ploughing.*

The manner of ploughing in the eastern counties, with two horses abreast and without a driver, is, it appears, identical with that practised in Scotland, to which country Loudon (*Encyclopedia*, p. 139) says, that a Mr. Dawson of Harperton, Berwickshire, first introduced it; Morton in his book on Soils mentions the year 1763, and the county he took it from Norfolk.

Mr. Young (*Suffolk Report*, p. 46) thus mentions Suffolk ploughing in 1797, by which it appears that it was equally as good then as now:—"In every part of the county this is done with a pair of horses, conducted with reins by the ploughman; and the quantity of land usually turned in a day is an acre upon stiff soils, and from one and a quarter to one and a half on sands.

"The ploughmen are remarkable for straight furrows; and also for drawing them by the eye to any object, usually a stick whitened by peeling, either for water-cuts or for new laying out broad ridges, called here *stitches*; and a favourite amusement is ploughing such furrows as candidates for a hat or pair of breeches, given by alehouse-keepers or subscribed among themselves, as a prize for the straightest furrow. The skill of many of them in this work is remarkable." This kind of competition is still in vogue in some places. I have heard it objected that it is impossible for a perfectly straight furrow to be drawn to a single object, that there must be at least two poles used, so placed in a straight line that one pole covers the other. However, I can only say, that the drawing out furrows to a single pole or peeled stick is the only plan used, that the furrows are drawn perfectly straight, and that it is no more impossible to do this than to lead a drill horse straight across a field.

The soil on the heavy lands of Suffolk is, as remarked in the *Suffolk Report*, "so exceedingly strong and wet in winter, that it will scarcely admit anything to go upon it: and in summer when dry will not yield to the heaviest roller, which makes it one of the worst countries in the kingdom to cultivate." Powerful horses are necessarily employed; the plough generally used on heavy soils is a swing or foot-plough: that on the lightest sands, the Norfolk wheel.

As to the Suffolk plough-harness, I see from the plates in Stephens' '*Book of the Farm*,' that it is precisely that of the Scotch, and so far from "the Scotch harness being a mere featherweight in comparison with the English," I find on experiment that ours is the lighter of the two.

|  | Scotch (Mr. Stephens').<br>lbs. | Suffolk.<br>lbs. |
|--|---------------------------------|------------------|
| Collar . . . . .                             | 15                              | 12               |
| Haims, plated with iron, and strap . . . . . | 7                               | —                |
| Suffolk wooden sales and toplatch . . . . .  | —                               | 6                |
| Bridle . . . . .                             | 4½                              | 4                |
| Backband . . . . .                           | 3½                              | 1½               |
| Chains . . . . .                             | 8                               | 5                |
|  | <hr/> 38                        | <hr/> 28½        |
| Reins (plough-cord 2 lbs.) . . . . .         |                                 | 1                |
|  |                                 | <hr/> 29½        |

I have taken a high average, as I find Collar sometimes 8 lbs., Sales and Toplatch 5 lbs., Bridle 3½ lbs., Chains and Backband 6 = 22½. This is on a loam; no doubt on stiff clay they are rather heavier. The backband is used in Suffolk to alter the line of draught in the same manner as is alluded to in the Royal Agricultural Journal, vol. i. p. 238: "In the harness of the Clydesdale horses, there was a backband of strong leather, 3½ inches wide, moveable along the back of the animal to different points, which carries the traces level from the collar, so that the line of draught is shortened considerably, and the horses work at the same time from the back with an uplifting power, and from the shoulders with an advancing power. In this neighbourhood the trace of the horses is not supported on their back, but passes in a straight line from the point of their shoulders to the beam of the plough, so that they draw of course from the shoulder. I do not know whether this is general, but it is certainly figured so in many works of agriculture."

*Origin of the Suffolk Horse, Cow, and Swine stock.*

The Suffolk hog shows its half-Chinese descent in its "upright ears, dish face, and pendent belly;" but I think it is probable that the horse and cow stock were formed by a long continued course of selection, and not, as some imagine, from some foreign stock. I shall proceed to give my reasons for this opinion regarding the horse and cow.

*The Horse.*

The exertions to improve this breed date from more than 120 years back, as we learn from advertisements that trials of team against team were even then common. Those who suppose a foreign origin go entirely upon conjecture and cannot even agree among themselves. Mr. Youatt, in his work on the Horse, states the Suffolk breed to be a cross between the Norman stallion and the Suffolk cart-mare; while the Rev. Mr. Rham, in an article on the Agriculture of the Netherlands, Jour. Royal Agr. Soc., 1842, p. 262, says, "The horses in the Netherlands may be divided into two distinct breeds, the heavy Flanders horses, which

are either light chestnut coloured, with white tails and manes, or roan. They are bulky, but not active, and not to be compared to the Suffolk punch, which breed *came no doubt originally from Flanders*; but is much improved by a judicious choice of both the mares and stallions selected for breeding. The other breed is the black Friesland." But Mr. John Burke, in the 5th vol. of the Journal, p. 525, says this light-coloured Flemish breed is "decidedly the very worst breed of horses he ever beheld," with "flat feet," and "legs that can hardly support his unwieldy carcass;" but that their "large necks and heavy crests" deceive the unwary. He speaks of the stallions (the best of which may be seen in some London brewers' drays) as cumbersome, ill-proportioned and slow, mare-headed, flat-sided, and weak in the loins, quarters, and legs, and the "crossing of our mares with these has tended not a little to reduce the superiority of our breed of cart-horses."

The only similarity between the Suffolk and Flemish breeds is the colour; but chestnut is no uncommon colour in any breed, and it is said that all the wild horses of America are bay or chestnut. I cannot imagine how a cross with an inferior breed can produce a superior one, or how a cross with a breed only partially chestnut in colour can be supposed to have produced another breed entirely chestnut.

There is another curious question relating to the Suffolk breed. From the first full account we have, that of Young in 1770, to the present day, there has always been a complaint, that the old breed was becoming extinct. Thus in 1797 Young says, "In some respects an uglier horse than the old breed could not be viewed; sorrel colour, very low in the fore-end, a large ill-shaped head with slouching heavy ears, a great carcass, and short legs; but short-backed, and more of the punch than the Leicestershire breeders will allow. These horses could only walk and draw, they could trot no better than a cow. Of late years, by aiming at coach-horses, the breed is much changed to a handsomer, lighter, and more active horse." Mr. Youatt also, writing recently, speaks of the original breed as nearly extinct, and praises it "as being the very horse to throw his whole weight into the collar, with the sufficient activity to do it effectually, and hardihood to stand a long day's work."

How this agrees with the foot-note in the Suffolk Report, p. 217—"Clean legs and well-formed shoulders are criterions of the *true* Suffolk horse, points which entitle them to be *good movers*; and such they are in general if used in *chaises*, and not too long habituated to draw only;" and with the following remarks from Sir T. Cullums, Hawstead, 1780—"Suffolk punch horse is of a remarkably short and compact make, and generally about 15 hands high, their legs bony, and their shoulders loaded

with flesh. They are not made to indulge the rapid impatience of this posting generation; but for draught they are perhaps as unrivalled as for their gentle and tractable temper. Though natives of a province varied with only the slightest inequalities of surface, yet when carried into mountainous regions they seem born for that service. With wonder and gratitude have I seen them with the most spirited exertions, unsolicited by the whip, and indignant as it were at the obstacles that opposed them, drawing my carriage up the rocky and precipitous roads of Denbigh and Caernarvonshire." Now it is not likely that a gentleman should choose for his carriage horses that "could no more trot than a cow," and as "ugly" as could anywhere "be viewed;" and a breed which for 80 years has been continually lamented as nearly extinct, could not, one would think, be the only original stock, but must have been a variety only employed on the strongest soils, while on all others a lighter and handsomer kind was used.

I have alluded to drawing-matches: they appear to have been commonly practised, almost to the end of the last century; the following advertisement from the *Suffolk Mercury* of June 22, 1724, will show their antiquity—"On Thursday, 9th July, 1724, there will be a drawing at Ixworth Pickarel, for a piece of plate of 45s. value; and they that will bring five horses or mares may put in for it, and they that draw 20 the best and fairest pulls, with their reins up; and then they that carry the greatest weight over the block with fewest lifts and fewest pulls, shall have the said plate, by such judges as the masters of the teams shall choose. You are to meet at 12 o'clock, and put in your names, or else be debarred from drawing for it, and subscribe half-a-crown a piece to be paid to the second-best team."

"The trial was made with a waggon loaded with sand, the wheels sunk a little into the ground with blocks of wood laid before them to increase the difficulty. The first efforts are made with the reins fastened as usual to the collar; but the animals cannot when so confined put out their whole strength; the reins are therefore afterwards thrown loose on their necks when they exert their utmost powers, which they usually do by falling on their knees and drawing in that attitude. That they may not break their knees by this operation, the area on which they draw is strewn with soft sand."

#### *Cows.*

Culley, in his work 'On Live Stock,' observes, that the Suffolk duns are nothing more than a variety of the Galloway breed, originating in the intercourse that has long subsisted between the Scotch drovers of Galloway cattle and the Suffolk and Norfolk

graziers who feed them. This opinion is, I think, incorrect; the breeds agree in nothing else except in their small size and being polled. In colour, in shape, in properties (one excellent for milking and inferior for fattening, the other just the reverse), they differ. Suffolk has been noted for its dairy more than 250 years (see Camden's 'Britannia'), and it is not at all likely that there should have been droves of Scotch cattle then, when England and Scotland were under different governments, and when, on account of the want of winter provender, beasts had to be killed and salted down at Martinmas. Such an importation of beasts would not be wanted in Norfolk till the turnip husbandry was established, nor in Suffolk till the dairying system was given up; for before that time, Suffolk was a breeding county, and sent her calves and young stock to other counties to fatten. The Suffolk breed has originated from a long course of selection of those animals best suited for milking; and hornless, because horns would be inconvenient to milch stock. Indeed Loudon says that the Galloway is the new breed, "that it is not more than 70 or 80 years since they were all horned and very much resembling the Highland black cattle, but that at that time they were coupled with some hornless bulls of a kind not accurately known, but which were then brought from Cumberland."

The difference in the breeds is—

| SUFFOLKS.   | GALLOWAYS.   |
|---|--|
| Colour mostly duns.   | Colour mostly blacks.  |
| Milk large in quantity.   | Milk small in quantity, but rich.  |
| Shape—thin, clean, snake head; hip-bones high and ill covered, and a general habit of leanness. | Shape—form beautifully rounded, without projecting knobs; head short, with rough ears. |

II.—*The Opinions of Correspondents residing in various Parts of the County upon the present State of Agriculture in Suffolk, referring more particularly to the subjects named by the Royal Agricultural Society, to the Suffolk Leases, and to Statistical Returns of the Farming.*

No. 1. By JOHN PEIRSON, Esq., Broadwater, Framlingham.

SUFFOLK, one of the most eastern counties of England, contains an area of 1515 square statute miles, or about 969,000 acres of land, of which about 37,051 acres are waste, water, and roads, leaving 932,549 acres as the territorial extent of the twenty-one hundreds and three boroughs into which it is divided. The climate is one of the driest in the kingdom; the frosts are severe, and in the spring of the year the north-east winds generally prevail. It is considered highly salubrious, as the average mortality of all parts of the county has been found not to exceed

one in fifty-four, whilst the number of births is as one in thirty. The population is nearly all agricultural, that portion of it which is employed in the silk, straw-plat, and drabbett manufactories at Sudbury, Haverhill, Lavenham, and Syleham, forming comparatively trifling exceptions. There are extensive manufactories of agricultural implements at Ipswich, Leiston, and some other places; and malting is extensively carried on in various places in the county.

*On the Soils of Suffolk.*

I shall divide the surface soils into three classes: the heavy, mixed, and light soils.

By heavy soil I understand strong tenacious loam tending to clay, resting on a subsoil of clay, clay marl, or brick earth, requiring thorough draining. By mixed soils, good deep soil of loamy sand, with a subsoil of clayey loam, gravel, chalk, and marl, not often requiring draining, except on account of springs. By light soil, sands, tender loamy sands, gravel, and chalk, embracing all the subsoils common to mixed soil, together with dead loam and alluvial deposits. So intermixed are these three kinds or classes of soils, that it would be almost impossible accurately to define their various localities; for in one parish you would probably see all three existing and all farmed according to their relative properties; but the general arrangement, however, is found to be this, that wherever a river or rivulet passes through this county, the one or two or three hundred yards of flat land adjoining its banks are deep alluvial soil; beyond this, as soon as the land rises, you find light and mixed soil; and still higher up it either increases in stiffness to strong heavy land, or, as in some places on the highest part, to a burning sand. Taking the whole county in one view, as it is bounded by the sea-coast on the east, the valley of the Waveney and Ouse on the north, the river Lark on the west almost as far south as Newmarket, the river Stour on the south, this statement will be found to be generally correct; you will find the alluvial deposit adjoining these boundaries generally covered with grass, as marshes or meadows; next, for several furlongs or even miles in some places, the light soil gradually merging into the mixed soil; and beyond this, as in the centre of the county, the heavy soil. The boundary-line which divides Suffolk from Cambridge (lying between Newmarket and Haverhill), not consisting of any great valley or river, but passing over high ground, is a continuation of the line of strong loam which crops out through the whole range of central Suffolk.

To render these divisions still more minute, let us pass along the sea-coast. Starting from Languard Fort, its southernmost point, passing by Aldborough, Southwold, Lowestoff to Yarmouth, there will be found immediately behind the sea-wall or beach a flat of marshes; then three to six miles of light soil, and then about a similar extent of mixed soil before reaching the heavy land. From Yarmouth down the Waveney valley, passing through Beccles and Bungay, the very same distribution of soil occurs, only substituting one to two miles instead of three to six. Passing on by the river Ouse to Thetford and Brandon, and turning the north-west corner of the county by the river Lark, the subdivisions are on a much larger scale. The marshes are here called fens, as Laken-



heath and Burnt Fens, and the light soils extend many miles inland, as far as the high road through Woolpit, Bury St. Edmunds, Newmarket, and even in some points to parishes south of this line, before it joins the heavy soils. Returning to Languard Fort and thence passing through the valley of the Stour by Stratford, Nayland, Sudbury, Long Melford, and Clare, the same variations exist as in the Waveney valley, the heavy soil approaching nearest at Long Melford.

The parishes comprised within the heavy land district are the following, viz.: in East Suffolk, Shaddingfield, Brampton, Westhall, Holton, Halesworth, Redisham, Ringfield, St. Andrew, St. John, St. Lawrence and St. Margaret's Ilketsall, St. Peter's, St. Michael, St. Margaret's and All Saints' Southelmham, Cratfield, Huntingfield, Horham, Withersdale, Metfield, Wilby, Laxfield, Ubbestone, Haveningham, Peasenhall, Kelsale, Bruisyard, Baddingham, Rendham, Cransford, Sweffling, North Glemham, Parham, Framlingham, Kettleborough, Letheringham, Hoo, Charlsfield, Monewden, Otley, Ringshall, Helmingham, Framden, Brandeston, Creethingham, Ashfield, Winston, Pettaugh, Stonham, Debenham, Mickfield, Athlington, Redlingfield, Southolt, Worlingworth, Brundish, Tannington, Saxtead, Earl Soham, Dennington, Kenton, Monk Soham, Bedfield; and in West Suffolk, Rishangles, Thorndon, Aspal, Wetheringsett, Mendlesham, Brockford, Cotton, Gipping, Newton, Stonham, Haughley, Bacton, Wyverstone, Ashfield, Elmswell, Norton, Badwell Ash, Shelland, Halston, Onehouse, Drinkstone, Rattlesden, Buxhall, Brettenham, Hitcham, Bidestone, Nedging, Whatfield, Wattisham, Barking, Lavenham, Cockfield, Bradfield St. Clare, St. George and Combust, Alpheton, Shimpling, Welnethan, Boxted, Somerton, Hartest, Lawshall, Stanningfield, Brockley, Hawstead, Whepatead, Reed, Ickworth, Chevington, Chedburgh, Depden, Denston, Wickham Brook, Stradishall, Ousden, Lidgate, Cowling, Great and Little Bradley, Great and Little Thurlow, Withersfield, Wrattling, Keddington, Barnardiston, Poslingford, and Hundon, which last-named parish is perhaps one of the most tenacious clays in the whole county. But it must be borne in remembrance that throughout the heavy land district, wherever a valley with a rivulet is found, however small, the flat is generally deeper soil and the sloping land adjoining more tender.

These parishes constitute what is known as Central Suffolk, beginning a few miles south of Lowestoff and Beccles, forming one continued chain of heavy land, contracting in width as it passes round the head of the Orwell valley, between Stowmarket and Woolpit, and again expanding till it passes into Cambridgeshire between Newmarket and Haverhill. The reader will now perceive that he might ride the whole circumference of Suffolk without leaving the light soils, except between Newmarket and Haverhill, and that he might also ride across this county from Ipswich to Bury St. Edmunds by the valley of the Orwell without seeing any heavy soil, as the road through the parish of Haughley lies so close to the river Gipping. There is a remarkable fact which should here be mentioned, that throughout the eastern division of this county chalk or marl is found to exist in such small quantities as to be unworthy of notice. The most eastern place where chalk is found in

abundance, both for building and agricultural purposes, is comprised in the angle lying between and including the parishes of Coddensham, Needham Market, and Offton. There it crops out and penetrates to a very great depth. Sudbury with Little and Great Cornard have a fine substratum of chalk and limestone. A good vein of chalk is also found in the parish of Stoke by Clare, and thence but little chalk appears till we approach the road from Newmarket to Bury St. Edmunds, from whence to Thetford, comprising the whole north-west quarter of Suffolk, there is abundance of chalk, marl, and limestone.

The strong clay loams of the eastern division are better than those of the western, and the sands on the east or maritime district, than those of the western. The southern part of this county comprises a fine tract of deep rich soil, lying in the Samford hundred and extending beyond the Orwell into Colneis hundred. Within the boundaries of this last-named hundred and situated near Langard Fort is the parish of Walton, where a deep alluvial deposit forms one of the most productive localities in the whole county (a well was dug in the parish of Walton 30 feet in depth without passing through the alluvial soil). The adjoining sea-cliffs at Felixtow are especially worthy of the observation of the agriculturist. Immediately under the upper stratum of light sand and mixed soil, and within three feet of the surface, lies a stratum of crag 16 to 18 inches in depth, thickly studded with coprolites (supposed to be the dung of the plesiosaurus), which, upon careful analysis, is found to be composed as follows:—

|                   |   |   |      |
|-------------------|---|---|------|
| Phosphate of lime | . | . | 53·5 |
| Carbonate of lime | . | . | 20·5 |
| Sand              | . | . | 6·5  |
| Moisture          | . | . | 6·5  |

As some of these ingredients are known to form good manure, a London company has been tempted to offer to purchase this crag on speculation. I saw one heap collected of about thirty tons; but difficulties, I am informed, have arisen, as it is a matter of dispute whether the crag is the property of the lord of the manor or of the owners on whose property it is found. In this stratum large bones are found; then follows a stratum of crag, or rather I should say shell, for it is one mass of shells from 2 to 6 feet in depth. Immediately under this to a very considerable extent is seen the London plastic clay running out into the sea, and which by the action of salt-water and air forms the large quantity of cement-stone yearly collected at this place. Iron-stones are also found here, and in the plastic clay copperas and decayed wood.

#### *The Management of the Land on the various Soils.*

1. *The Management of Arable Land.*—The four-course system of cropping is almost universal in Suffolk; nearly all Suffolk leases have a clause compelling its adoption, viz. :—

- 1st year, fallow, with mangold-wurzel or turnips.
- 2nd year, barley or oats.
- 3rd year, clover, beans, or peas.
- 4th year, wheat.

When owners farming their own land vary from this course in heavy soil, I find it is either to fold and take oats after wheat, as a five-course, or muck after wheat for beans, and then wheat as a six-course; in either case clover preceding the wheat. In light soil the plan adopted is to let the clover, sainfoin, or rye-grass lie two or three years, thus making either a five or six-course.

*First Year.—Fallow.*—On *light land* the mode pursued is to fork out all grass and weeds in the autumn; plough and drill part with rye in September, and feed off with sheep in March and April. Some plough after feeding only once, others three times, and drill swedes in May or June, with malt-coombs or rape-dust. Horse-hoe as soon as up, and finish by hand-hoeing. Part is drawn off for cattle and part sheep-folded during the winter. On other portions of fallow the custom is to drill tares, to be folded after the rye is finished; plough once or three times, and drill common white turnips, with some artificial if no farm-yard manure has been spread.

Should any portion of the fallow land be of a sufficient mixed-soil character to allow of mangold wurzel, it is ploughed and cromed in the autumn till well cleaned; the farm-yard manure is carted upon it either during the frost of winter or very early in the spring, ploughed in on the flat, rolled, the beet-seed drilled in April (3rd week), horse-hoed, hand-hoed, and singled by women if required. This root is always carefully stored for use late in the spring. The farm-yard manure is always used in the first instance for mangold-wurzel, the remainder for swedes and common white turnips, supplying its deficiency by artificial manure. One farmer that comes under my observation (and a cleaner or better tenant-farmer Suffolk cannot produce) in the autumn of 1845 cleaned and ploughed in a wheat stubble, drilled rye, folded this off in March, 1846, ploughed and drilled gold-of-pleasure grass, harvested this in July; again ploughed and drilled white turnips, which are now in the month of December folded off with sheep; has cattle fattening in yards with his gold-of-pleasure seed. The manner of folding in our light and mixed soils with swedes is greatly changed. These roots are now pulled up and thrown into small heaps of about three loads, covered with earth: generally a small piece of broom is stuck into the top to let out the heat, which broom is picked over by the sheep and is considered very beneficial to them. The heaps being opened, the turnips are cut by a machine, and the sheep are fed in troughs, the Suffolk farmer being convinced that the expense is more than paid by the economy of food.

Fallows on *heavy land* have undergone a remarkable revolution by the introduction of *mangold-wurzel*. So useful is this root for late spring feed, and being harvested and carted off the land before winter, that even the smallest occupier in Suffolk grows a portion of beet on his fallow. The land is prepared in the autumn by all the best farmers.\* The wheat stubble being carted off, the land is ploughed, ploughed back and harrowed, picked, and cromed; again ploughed upon stretches

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\* I shall consider my remarks throughout as applying to them; and proud am I to feel that, of any other class, very few are at present to be found.

of ten furrows (about 8 feet 2 inches wide) and well water-furrowed. Some proceed one stage further and balk it up, which is an excellent plan. Early in the spring (if not previously done) the balks or ridges are made 30 or 32 inches apart; farm-yard manure, about twenty loads of thirty bushels per load, is spread between the ridges, and then covered up by splitting the ridge with the plough; roll and then drill seed in April or May. Some dibble with large wood dibbles. When the plants are well up, a double plough and a double curved hoe are used alternately between the ridges, hand-hoeing the top; women singling, and thus when harvest arrives there is no work to perform in the man-gold-wurzel. These roots are carted off in October, clamped in rows 5 feet wide at the bottom and curving to a point at 4 or 4½ feet in height, covered over lightly with straw and then well earthed up, leaving holes on the top to let the heat escape. The land being ploughed up immediately after the beet is carted, there is no necessity for spring-ploughing for barley, and by laying light and dry all the winter a fine tilth is obtained for the spring corn. Many farmers, however, grow wheat instead of barley, believing the wheat-crop succeeds beetroot better than barley; others prefer giving the land a second ploughing before Christmas, being of opinion that barley follows equally well. A small portion of heavy-land fallow is drilled as soon as the wheat stubble is ploughed (say September) with winter tares, for mowing for cart-horses or cattle, and then generally cleaned, followed during the remainder of the summer by repeated ploughings and harrowings. Sometimes a portion of these tares is folded with sheep, as it is the only season of the year that the heavy-land farmer can fold sheep. The remaining portion of fallow is generally white turnips; the wheat stubble not turned in till the spring; ploughing, harrowing, and rolling at proper intervals in dry weather; for no man ought to stir man or horse in wet weather on heavy land if it is possible to prevent it. Some drill the turnips on small ridges, others sow with a handbarrow seed-machine on stretches of ten furrows. The turnips on heavy land are generally two-thirds pulled and carted off before Christmas, the remainder in February; but many pull all before Christmas, setting them up with tops and tails on in the stackyard, or on a wheat stubble, so that the land may be ploughed early, as Suffolk men know they shall get a very poor crop of barley if carted off when wet or too late in the spring. Swedes are not generally grown on our heavy land, but when grown are instead of beet, and the land is farmed in a similar manner.

*Second Year.—Barley.*—On light soi's which have been sheep-folded it is a common practice to plough three times; by this means the manure is more equally dispersed, and experience has proved that a dry summer does not injure the barley so much as it does when the land has been ploughed only once. When the new year has commenced, the Suffolk plan is never to let a favourable opportunity escape for drilling barley if the land is prepared. About three bushels per acre is the usual quantity of seed used. Chevallier and Nottingham long-ear are amongst the favourite varieties. Red clover, or white suckling, or mixed seeds are generally sown with the barley if not drilled before March, but if drilled earlier in the year then sown when barley is well

up, and rolled in. About three-fourths of a peck per acre of clover-seed is most commonly sown, but some prefer one peck per acre.

On heavy land the same system is pursued, except that there is never any ploughing late in the spring; working the cromes, or long-toothed harrows, before drilling. The usual system of harvesting is general throughout Suffolk, with the exception that in East Suffolk a rake is used for gavelling, and in some parts of West Suffolk a three-pronged fork.

*Third Year.—Red Clover, White Suckling, Italian Rye-Grass, Mixed Seeds, Beans, or Peas.*—Clover is generally mown for stover once on light and mixed soil, and then fed; or if intended for seed, it is sheep-fed early in the spring. On heavy land it is often mown twice for stover; or if only once, then left for seed. Mixed seeds are generally mown once, and then sheep folded. Our Suffolk soils will not allow of red clover being sown more than once in eight years. Peas are generally drilled on light soils; beans on heavy soil, but some dibble them. The general practice on heavy land is to muck for the beans instead of the wheat; if there is sufficient manure, for the clover likewise. We have thus two crops before the fallow, and a better chance to get the wheat in early and well. Tick beans are generally grown; Mazagan beans for horses. Of peas maple is the favourite. The horse-hoe is freely used for cleaning peas and beans.

*Fourth Year.—Wheat.*—The drill is almost universally used. If early in the year, five or six pecks per acre for seed; if later, seven or eight pecks. The land after ploughing is well rolled and harrowed, believing wheat-land can scarcely be too solid. The practice of mowing wheat has greatly increased of late years, and has facilitated the autumn work, at which season of the year every day is of importance. This method is adopted not only on account of the greater expedition in cutting, but because when it is carted the land is ready at once for the plough. The general favourite this year (1846) is Spalding's red, which has yielded, for the last three or four years, very considerably more per acre than any other kind. Of white the old Tunstall is still a great favourite, notwithstanding its liability to mildew.

I think any one who has ridden along the high road from Ipswich to Yarmouth will say that he has seen in no other county in England such handsome-built stacks of wheat. Many farmers thresh all their wheat-stacks abroad with the machine, believing it a considerable saving of expense. One occupier informed me that for the last six years he had not carted one sheaf of wheat into his barn.

*Sainfoin.*—This grass is highly valued in the sand district of Western Suffolk, lying between Thetford and Newmarket. It is generally drilled at the same time as the barley, but across it, producing the following year a good quantity and quality of hay, and affording excellent feed for sheep. It may be mown a second year with equal success. 120 bushels of cinder-ashes are considered equal as manure for sainfoin to 400 bushels of farm-yard muck. This grass is not grown in any other part of Suffolk, where, perhaps, from the absence of chalk, it would not succeed.

*Trefoil.*—When this is required for feeding, it is generally sown mixed with other seeds: but on the Western Sands there is a large breadth grown entirely for the seed. One merchant at Thetford buys yearly 10,000 sacks of trefoil-cosh, which he threshes by steam; shipping the seed to Scotland, Ireland, and elsewhere: selling the chaff or cosh to the farmers for their sheep in winter.

*Lucerne.*—This is grown in many parts of this county on a small scale. A large light-land proprietor and occupier informs me that the drilling of lucerne, with forking and cleaning yearly, besides manure, may do well for a very small piece. His plan is, to fallow a piece of ten acres perfectly clean, sow it very thick with lucerne, mow and manure it for three or four years, and then plough it up before it has accumulated much couch-grass and other weeds, and then to sow another piece.

*Mustard.*—The growth of this is considerably increased, as it is used either as feed for sheep or is ploughed in green as manure for wheat.

*Carrots.*—The red carrot is not grown to the same extent as formerly, even in our maritime districts; the white, introduced six years ago, being generally preferred. And upon the whole, calculating the expense of cultivation, the exhausting nature of the crop, the breadth of carrots sown is diminished by the growth of mangold-wurzel and swedes.

*Chicory.*—Has been introduced into our maritime sands about four or five years. Many acres of it are now yearly grown, instead of carrots or other roots or peas, in the neighbourhood of Alderton and Sutton, where three kilns for drying it are erected; whence it is packed in bags and forwarded to the London market for mixing with coffee.

*Flax.*—The growth of this plant has attracted much thought, but at present has made very little progress; 16 bushels of seed of excellent quality are grown per acre, but the straw has generally been too short to pay the cost for preparing it for manufacturing purposes.

#### *Draining.*

The Journal of the R. A. S. has shown that thorough draining was known in the eastern parts of England more than 150 years, but the writer cannot find that thorough draining began to be generally adopted till sixty years ago, when the farmers began ploughing up their grass land. *Necessity* compelled the practice, for without it they could not have continued to grow corn, and the land must have returned to its former state of pasturage. One old labourer, after stating that the farmers began draining fifty years ago, added, "That draining is a good thing; but they never grew so many beans per acre since."

At the present time nearly every piece of land in the heavy land district of the county has been drained, and many pieces several times. It is the first step, the foundation of all improvement in the farming of heavy land in Suffolk; enormous as the outlay has been, no one distrusts the propriety of doing it, seeing the great increase of production which has resulted from it. Heavy land in Suffolk should never be touched in wet weather; but now, owing to thorough draining, it becomes dry so quickly, that a short time enables us to renew farming employments.

The subject of draining has often been discussed in our Suffolk Farmers' Clubs; the opinion of a club, of which I am a member, was as follows:—

"That 30 inches is a proper depth, and only 5 yards apart. Hand-draining with shoulders is decidedly best for arable land. That the expense of draining our heavy land in Suffolk was estimated as follows, 30 inches deep, mains 32 to 36 inches:—

|             | £ | s. | d. |           | £            | s. | d.  |
|-------------|---|----|----|-----------|--------------|----|-----|
| With Ling . | 2 | 7  | 3  | per acre. | With Haulm . | 2  | 1 0 |
| „ Furze     | 2 | 5  | 6  | „         | „ Bushes .   | 2  | 2 0 |
| „ Straw     | 2 | 10 | 6  | „         | „ Tiles .    | 5  | 5 0 |

"Since the year 1841, when this Report was made, the tiles have been reduced in price to 14*s.* and 16*s.* per thousand; the Report further states that ling (heath) was the best for filling drains: the members nearly divided in opinion as to whether 8 or 6 score rods were the best number for one eye. With respect to tiles the expense was considered too much for a tenant, and doubts were expressed as to their liability to fill up with soil; and also in our stiff clay soils whether draining with ling, which would last fifteen years, would not be more desirable: as breaking up the soil to renew the drains would again enable the water to descend more rapidly after rain."

I have copied this Report, as it presents a summary of the proceedings throughout Suffolk for many years, with the exception that drains are often made only 28 inches in depth. The plough opens a wide furrow going twice, and the third time deepens it, say 8 or 10 inches: the broad spade being 10 inches and the draining spade 10 inches. The price paid for 28 or 30-inch work varies from 3*s.* 6*d.* to 4*s.* 6*d.* per score rods, according to the soil; and of the mains of 32 to 36 inches deep, from 4*s.* 6*d.* to 5*s.* 6*d.* per score; and generally 3*d.* for a brow-eye and 6*d.* for a bank-eye; the clay being stamped upon the shoulders. Although this account of Suffolk draining is correct as to the past, a new idea is now very prevalent that drains should be 4 feet deep, and from 8 to 11 yards apart, or in some cases further: believing that the additional depth increases the facility of the water in descending, and that it is a more permanent and efficient drainage if done with tiles or pipes. Acting on this principle, much draining has been done, during the last year or two, 4 feet deep. The proprietor of land in Great Thurlow is one instance, and it may also be seen at Dennington, Yoxford, Bedingfield, and several other parishes. On the other side, it is contended that, on our stiff clays, a greater depth than 32 inches will not let the water escape so quickly; that it is surface-water and not bottom-springs that we have to combat on our Suffolk heavy land, and that 11 yards apart is too great a distance. Experience will in a few years determine whether the former practice or the new theory is the better plan.

So thoroughly does the Suffolk farmer understand the necessity of draining, that on light and mixed soils that have springs, on clay and gravel intermixed, he immediately drains, but often in this case cutting deeper; proceeding as before mentioned, using the material for filling up which he may think best adapted to his peculiar soil.

*Manures.*

Much greater attention is now being paid throughout Suffolk to the subject of the increase of the quantity of farm-yard manure. In addition to straw, weeds of all kinds, arising from trimmings of ditches and banks, sides of rivers and roads, are all carefully removed to the farm-yard for litter. Liquid manure is preserved in tanks, or so managed that it runs into a reservoir, into which rubbish of all kinds is thrown, so as to absorb the liquid and thus form a very important increase to the farm-yard. Suffolk farmers are convinced that no manure equals that from the farm-yard when well made; and therefore they think it desirable to spend a few extra pounds in improving the quality and increasing the quantity. The general practice is to spread farm-yard manure, and plough it in immediately afterwards. An exception to this rule occurs in the mode of proceeding adopted by a large owner in the maritime district, who invariably carts his manure for wheat as soon as the first crop of clover is mown, and this plan he pursues whether he mows or feeds the second crop. It appears to him that the manure is more incorporated with the soil, and does not suffer from the exposure to the air; his wheat he finds better. A farmer in the heavy-land district states, that when he begins to cart manure in the autumn for wheat he always carts it for beans at the same time, believing that if it laid spread till Christmas the beans were equally benefited by it. Guano has been extensively tried, and from the best information the results have been satisfactory. The light soils, for their root-crops, have more artificial manures applied than the heavy; the straw being less, they are obliged to supply this deficiency by the sheep, bones, guano, rape-dust, and malt-coombs.

*Clay, Loam, Marl, and Chalk.*

When the heavy-land district of Suffolk so greatly increased the quantity of its arable, it was found necessary to cover with clay the newly broken-up pasture, and this plan has been progressing during the last thirty or forty years; witness the large clay-pits throughout every heavy-land parish. In some localities it was found more economical to perform this by manual labour, using wheelbarrows, whilst in others horses and carts were preferred; so that at the present time I think I may say this operation is completed, our heavy lands not generally requiring it to be repeated. Immense quantities of clayey loam have been carted throughout our maritime districts, and in many parishes continued to this present time. I will mention one example to show to what extent this is performed. One individual, living between Wood-few bridge and the sea-coast, who farms very extensively, was accosted a month since by one of his workmen as follows: "Pray, Sir, may I have a new job next week, for I have been filling loam every day but Sundays for the last seven years?" Another practice in this district is to cart the marsh earth from sides of ditches to the upland sands, and bring crag from thence to the arable marshes, which has been found very desirable. Loam has been and is at the present time carted in very considerable quantities throughout the western sand-district, and is by many con-



sidered preferable to marl; for although marl has been found there most excellent for wheat, yet a sad mortality in the sheep has been observed whilst feeding on land that has been recently marled. The chalk-pits at Coddendam, where lime is burnt, have a very considerable demand upon them for agricultural purposes, as the farmers, for several miles around, cart chalk and lime to mix with manure heaps. The writer has purchased many waggon-loads of the best lime (100 bushels the load, at 4*d.* per bushel), and carted it a distance of 16 miles; generally mixing with clay, sand, or other material, and spreading it upon young clover layers, or for wheat, with beneficial effect. But as this is the nearest point for the whole of Eastern Suffolk where chalk can be found, the expense of carting prevents its being generally used as a manure; besides, farmers not possessing sufficient chemical knowledge of the nature of soils, are unable to determine which field would be benefited by it. Ignorance on this point often renders their exertions fruitless, and it has consequently deterred them from enterprise. The Stowmarket district obtains its chalk and lime from Needham market; the Hadleigh district from Offton; the Stoke chalk-pit supplies the neighbourhood of Clare and Haverhill.

#### *Pasture.*

The pastures in Suffolk are generally not so well farmed as the arable land, very little manure is carried, and if drained it is generally with the mole-plough. Amongst the very best farmers is seen a slowly increasing exertion to improve their pastures; weeds of various kinds are rooted out, the liquid manure-cart follows the scythe, and top-dressings of manure or mould are spread upon them. The extent of grass-land is small in the heavy district of this county, and every year it is becoming still less; I should think it does not average more than from 10 to 15 or 20 acres per 100. This will explain the reason why Suffolk is considered second only to Norfolk in winter-grazing; and perhaps it would be desirable to state here the mode of managing stock, with the kinds on the different soils.

#### *Cattle and Sheep.*

Very few cattle are bred on either the light or heavy soils, except a sufficient number of the Suffolk stock for milch cows. However bad their repute may be for grazing purposes, they still are generally considered to fill the pail better than any other kind. At Great Glenham House there is one of the best herds of true Suffolk (colour red) good milchers; the steers are fatted, weigh from 70 to 90 stone, of 14 lbs. per stone. At Parham House there is also an excellent dairy of Suffolk cows. There is a herd of short-horn cows at Cretingham Rookery of fine quality, the butter sent weekly to London, and the calves fatted at two years old. There is a large number of half-bred cows (Suffolk and short-horns) kept by an extensive occupier near Clare, who still maintains that with good management cows will repay the farmer better than grazing, and by high keeping make the manure as good. The Ayrshire have been tried in many places, particularly near Wickham Market. The usual reply to my inquiries respecting them is if you get a good Ayrshire, she is the best milcher in the county: but

you will find nine inferior to one superior ; whereas, in the old Suffolk stock eight out of ten prove satisfactory for the dairy.

Having only this small quantity of pasture in the heavy-land district, some of which is mown for hay, a part fed with cows, colts, &c., but little summer grazing land is left.

The practice is to attend the autumn fairs and markets, purchase short-horns, Scotch, or Irish beasts ; these are turned upon the rowens, or old grass remaining ; and immediately the wet and cold weather commences in October or November are put into warm yards, and fed with turnips, straw, and hay, cut chaff, with meal and cake. But a new era is opening for Suffolk by the adoption of summer-grazing in boxes and stalls, which plan is increasing ; mowing from the arable-land early in spring, rye, tares, and clover, and then grass from pastures : by which plan green food or root is provided through the whole year with other fattening.

Sheep, in the heavy-land district, are generally purchased when lambs, and often sold again before Christmas to the light and mixed-soil occupiers for folding on root ; or bought as hoggets in the spring, and sold between October and November. In either case, when kept through the winter, it is on a pasture or in a yard, with cut root, straw, and hay-chaff, except in very dry weather, when a wheat-stubble may sometimes be folded.

On our light soils grazing is conducted in the same manner ; where also extensive breeding flocks of sheep are kept—generally Down ewes (black faces), a little cross with the Norfolk, to increase their size, with a Leicester tup : thus getting lambs of good size, good quality of wool, and with aptitude to fatten. The last two or three years, one spirited breeder at Chillesford has introduced the Cotswold tups, from which the lambs have been superior : witness their prices at Ipswich lamb-fair. There are many flocks of celebrity of pure Downs, a few Leicester flocks, and still fewer real Norfolk flocks. The light-land farmer is generally the occupier also of the adjoining meadows and marshes, a most valuable addition to his farm, upon which he can graze cattle during summer, and at certain seasons finds it very convenient to depasture his sheep. Many light-land farmers keep up the number of their ewes to so large an amount that they sell off the lambs in July and August ; whilst others, with a less proportion in number of ewes, keep all or a part of the lambs through the winter, besides fattening many sheep.

#### *Fens.*

The fen district comprises that portion of land which lies at the north-west point of Suffolk ; it is bounded by the Ouse on the north, the river Lark on the west, and the villages of Mildenhall, Lakenheath, and Brandon on the south and east. In no part of the county have greater exertions been made to improve the soil than in this ; the surface is generally a peat or bog, from 5 to 8 feet or more in depth. The Act of Parliament, sanctioning a body of Commissioners for the Burnt Fen District, has rendered the drainage of the greater portion of the fens lying in Suffolk very efficient.

So porous is the nature of the soil, that if the dykes or water-courses are deep, well opened, and but little water allowed to stand, surface-

draining is seldom required. Some have tried tiles or pipes at 30 inches deep, but they are now of opinion that this plan was not necessary. The dykes having been well opened, the soil dry, enterprising farmers began to look at the subsoil, and finding a good white clay or marl in many localities, they determined to dig it out and spread it upon the surface. The marvellous improvement of the land which has resulted and is still progressing from the adoption of this system, I will explain by detailing the facts of which I have been an eye-witness on one farm in the fen district.

The farm contains about 300 acres; the soil is a peat 5 feet in depth, under which there is a beautiful white clay or marl. The dyke-drainage is very good; within the last nine years the occupier of this farm has twice marled the whole of it, each time spreading 250 to 270 loads per acre (27 cubic feet per load), in all say 500 loads per acre, at an expense of 8*l.* per acre. Nine years ago the total produce was under 200 coombs, reckoning all kinds of corn and seed, of which there was very little wheat, and there was no stock except horses and colts. The price of cutting wheat was then 5*s.* 6*d.* per acre. At this time (in 1846) the produce is more than quadrupled. Large numbers of sheep are fed both in summer and winter; cattle are grazed as well as a considerable number of pigs. Wages this year for cutting wheat, 12*s.* per acre. Wheat has taken the place of cole-seed: mangold-wurzel, swedes, and common turnips are as good as I have ever seen, and a regular system of 4-shift husbandry is adopted:—

- 1st. Mangold-wurzel, swedes, and white turnips, folded off by sheep, or carted off for cattle.
- 2nd. Oats, barley, or wheat.
- 3rd. Red clover or rye-grass.
- 4th. Wheat.

About 3 horses are employed to 100 acres; 24*s.* per acre are paid for yearly labour, and the drainage-tax is about 5*s.* per acre. The wire-worm is one of the greatest enemies of this district, but by growing a crop of mustard this evil has been found to be lessened; 8 to 10 pecks of wheat are drilled as seed per acre; half a peck per acre of cole-seed is drilled; 12 bushels of bones per acre are considered best manure for cole; 12 bushels of bones with 5 loads of farm-yard manure are given for the turnips. Wages to men for claying are 3*s.* to 3*s.* 6*d.* per day; this work, it is said, affects their eyes. "No ague, now," observed a poor woman to me; "but when I was a girl we almost all had it." Nearly all Burnt Fen is arable, and capable of this improvement by claying.

Much has already been done, but there are localities where the soil, instead of peat, is a white ewe, containing fresh-water shells, but found very unprofitable for agricultural purposes. One farmer has this year dug through the white ewe nearly 10 feet in depth, and finding clay he covered 14 acres, in the usual fen manner, at an expense of 134*l.* But many doubts are expressed as to whether the upper soil of white ewe will be rendered sufficiently productive to repay the outlay. Much depends on subsoil in all these improvements. Lakenheath Fen, resting on a sand or dead loam, would probably not give similar results. At Mildenhall and its vicinity chalk is burned for lime, or rather I

should say clunch is burned (this partakes of the character of chalk and limestone), and when burned makes the best. Many waggon-loads are carted from this neighbourhood as far as Stowmarket, for building purposes. Peat is the general fuel in the fens, and some acres are hired for cutting peat for market—say rent 30*l.* per acre, for a term of three years. Having cut and dried a part to the depth of 12 inches or more, the pit, if not too wet, is dug and planted with potatoes, so that at the end of three years it is nearly all in cultivation; or if left uncultivated, it is stated that in twenty years it will grow up again.

At Eriswell, on the fen skirts, there is grown a very superior quality and quantity of red clover-seed, and this is the more remarkable as this is almost the only parish in the north-western division of Suffolk where red clover-seed is grown.

Many thousand acres of land on the fen skirts are warren, at Lakenheath, Mildenhall, Wangford, Elden, Brandon, and Theiford, which produce only rabbits, plovers, eggs, and young pigeons for the London market.

*Suffolk as it should be.*

The improvements still required in the county generally, as to higher culture of existing farms, mainly depend on some alterations in the leases. At present eight years is the usual term, or two rounds of the four-course shift. The first four years the tenant drains, manures, cleans his land, employs a fair quantity of labour, and farms as he always ought to do; the last four years he expends little for labour, and still less as he approaches the termination of his lease. It is one continued routine of four years good farming and four years moderate with, I fear, too many. If spoken to on this subject, the farmer says, "I must do this to secure myself; for if I improve the estate by the outlay of my capital (although I should not fear my present landlord), he may die or sell the farm, and then the next proprietor may either make me pay interest for my own capital in the shape of additional rent, or else some other person will become the tenant instead of myself." I do not here mean to discuss by what means these difficulties can be best surmounted. I must, however, be permitted to observe that security of tenure and identity of interest between landlord and tenant will tend to increase the productions of the Suffolk soil. The basis of leases, I think, ought to be this: that the landlord should have a fair rent for his land. In case of war or other unforeseen events materially heightening the price of corn, he should be entitled to further consideration; or if increasing knowledge in agricultural pursuits should lessen to a decided extent the cost of production, then that he should be justly entitled to participate in this advantage. On the other side, the tenant should have no cause to fear to increase the productions of the land by outlay of capital, but rather feel that with good conduct it would be a fortune to his children.

In many parts of Suffolk, particularly in the heavy-land district, the enclosures are much smaller than would be necessary if a more systematic plan of draining were adopted. One of our farmers' clubs in this county calculated the loss of land at 6 per cent. in the heavy soils, and an additional loss of between 3 and 4 per cent., occasioned by thick

and lofty fences, hedge-row timber, and pollard-trees. This surely is worth the attention of both landlord and occupier.

Most unwilling am I to offer a single remark which may give offence; still, as a chronicler of facts, I must be allowed to state that the education of the sons of small tenant-farmers in Suffolk is lamentably deficient in many cases. The expense of education is at present so great that the prudent man, who has two or three sons, is compelled to choose as a matter of course the village school rather than the county grammar-school at 40*l.* or 50*l.* per year. The Royal Agricultural College\* at Cirencester has begun to pave the way towards a good and cheap education; and this the tenant-farmer would consider an improvement on the old system, if the College were situated so that his boy could go to the school in the morning and return home the same day; but that at present he can derive little benefit from it, as the journey backwards and forwards from Cirencester to Suffolk would increase the expense of his education to that of the best school in the county. What he wants is a *county school*, established for farmers' sons, at a reasonable expense; or else, owing to the advantages which the free and parochial schools, now spread throughout the county, afford our labourers' children, they will be better taught than our own. This is also another matter requiring the gravest attention of all those who are interested in the well-being of the present and future tenantry of Suffolk.†

In Suffolk the change of occupation takes place at Old Michaelmas (October 11th), and not, as in almost all other counties, at New Michaelmas (September 29th). An Essex farmer, having hired a Suffolk farm, was obliged to quit September 29th, and could not get possession till October 11th; this occasioned him great loss and inconvenience. Two or three farmers' clubs in Suffolk have discussed this point, and are of opinion that it would be very beneficial to the outgoing and in-coming tenants, to adopt a uniformity of practice, and for this purpose to have the movement take place on September 29th. This can only be effected by the landlords as a body at once altering the time of taking possession.

The waste lands in Suffolk are few and far between, and every year they are still lessening in their amount: so little now remains of them, that no notice is required except to observe where there are unenclosed lands we generally find some difference of opinion to exist regarding the respective copyhold rights; perhaps a law still further to facilitate the enfranchisements of copyholds and enclosures of wastes might be desirable.

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\* The fee at the Cirencester College has been raised since the above was written.

† This subject most deservedly begins to occupy the minds of many of those connected with farming in this county, and it is certain that, if the Suffolk farmers of the succeeding generation are to hold the same place which their fathers did in the scale of agriculture, it must be by a better system of education. The establishment of a proprietary agricultural school in Suffolk, for the education of farmers' sons, has been advocated by Henry Wilson, Esq., of Stowlangtoft: it is to be hoped that, in a few years, his suggestions will be carried into effect. Perhaps there is hardly another county more favourably situated for an establishment of a school of this description, in the variety of soil, in the superior management of light and heavy land, and in the workmanlike style in which the operations of the farmer and labourer are carried on.—H. R.

**No. 2.—By MR. CHARLES POPPY, Witnesham, Suffolk.**

The climate of Suffolk is one of the driest in England, 24 inches is computed to be the average fall of rain; but being a maritime district, and intersected by tidal and other rivers, thunderstorms and summer showers are less frequent and of less duration in some districts than in others. Electrical clouds are attracted by the sea and rivers, hence it frequently happens in the spring months that it is difficult to obtain a plant of beet, white carrots, and swede turnips on the heavy table-lands, which induce the occupiers of such lands to sow these crops early. Until July we seldom get following showers suitable to forward the growth of swedes.

*Various Soils.*

I shall confine my observations under this head to the coast soils and the heath district; as sufficient information as to the other soils may be obtained from Young's Report.

*Coast Soils.*—Along the sea-board from Yarmouth to Aldborough, there are marshes, heaths, sandy loams, and barren spots. From Aldborough to Hollesley Bay, an immense bank of shingle, called the North Vere, protects the river Ald. Marshes of various extent skirt this river; chiefly solid ooze, or what is termed in the southern countries *fleech*. From Hollesley Bay to Languard Fort, the sea encroaches on the high land. From Boyton, Hollesley, Alderton, Bawdsey, and by the tide river Deben, and from thence through Falkenham and Trimley, are wide districts of sandy loams, suitable for the growth of wheat, barley, carrots, beet, swedes, or any other produce.

*Heath District.*—From Ipswich race-ground a long strip of heaths extend through Nacton, Rushmere, and Brightwell, to near the Deben, where a strip of good corn-land, and marshes on each side of the river, divide these heaths from the heaths which extend through Shottisham, Bromeswell, &c., to Hollesley. Whins (*furze*), fern, and ling grow in patches along most of these heaths; on others nothing but ling. Belts of fir-trees surround one of the heaths, but are mostly of stunted growth; but great quantities are cut down annually, and are useful for rails, &c. It does not appear that these heaths can be cultivated. Where they have been encroached upon, and covered with loam at a great expense, the crops are but moderate. Large flocks of sheep are fed on these heaths, and folded on the adjoining lauds, which I think is the most profitable mode of occupation. The heaths must extend 10 miles, and I presume may cover 3000 acres. I merely venture an estimate of the extent. Along the whole tract of heath land, and in other places in this district, pits of great depth have been sunk to procure *crag* to cover the land, and some is still carted; but it appears that the *crag* laid on the sandy soils made the land still lighter and subject to drift by the wind. A considerable breadth of land in this district is liable to blow from the root of the corn, and sometimes the men have been obliged to give up harrowing, from not being able to see where they had harrowed.

*Crag* is a mass of shells, fishes' teeth, and bones. The depth of this deposit varies from 2 or 3 to 20 feet, and I believe much more. In

some places there is no mixture of sand or loam, in other pits different strata of earth and shells alternately prevail.

Geologists differ in opinion as to the cause of the whelks (called antediluvian), which are the most perfect, being twisted the contrary way to those that are found cast up by the sea.

In Samford hundred crag is dug, and light land occurs; but the most singular soil in Suffolk occurs at Naughton and an adjoining parish, *i. e.* a pure clay and rolled chalk, nearly in an equal proportion.

#### *Management of Stiff Soils.*

The course of cropping strong clayey and tenacious soils varies but little, I believe, over the county. The western district is less altered in its agricultural character than the eastern, and there is a less distinct boundary in the variation of soils; but none that require much observation, except that taking the turnpike from Stowmarket to Bury, the south side is chiefly a loamy soil, and the north side mixed soils, and sandy on a chalk subsoil. A thin weak pasty soil prevails at Hundon, and a few other places.

*Fallowing heavy Soils.*—Lands intended for fallow are ploughed as soon after wheat-seed as possible, and are thus left on the stetch till the spring. If time permits, most farmers turn the land back on the stetch. Others plough across the stetches without turning back. The land is ploughed a second time across (overwart), and stetched up before Michaelmas generally. If an opportunity occur, some plough the fallows a second time on the stetch before Christmas, that less scarifying may be required in the spring.

*Tillage required for white carrots.*—The land intended for beet and white carrots is broken up as soon after harvest as possible, harrowed, rolled, and pulverized, and a second ploughing given, pulverized, and laid up on the stetch, or ridged, if a good coat of manure was laid on the land for the previous crop, if not the manure is applied for these crops; as little tillage is given in the spring as the state of the land admits, and the seed is sown as soon as the land is in a proper state. On very heavy soils beet is planted sufficiently wide from row to row to admit of ploughing between.

Little difference exists in the mode of cultivating heavy or mixed soils for swedish or common turnips. Turnips are sown early on *heavy lands*, because they can neither be carted off nor fed on the land in winter, and late on light lands for winter and spring feeding.

#### *Thorough Draining.*

Although no authentic account of the first introduction of *thorough* draining exists, it is commonly supposed that it was first practised on Sir Gerrard Vanneck's estate (now Lord Huntingfield's).

The first field that I can speak *positively* as to being *thorough* drained, was in the parish of Cookley, probably not a mile from Huntingfield Hall, which was thoroughly drained in 1790 or 1791. I was then a farm pupil, residing with a tenant of Sir Gerrard's. It was an arable field of 6 or 8 acres; but whether it belonged to Sir Gerrard or not, I do not know.

The drains were drawn directly down the fall of the land, which was not great, and dug, I think, from 28 to 30 inches deep, at a rod or little more distance, and filled up with bushes strawed over. The tools were the same as are now used. While a large extent of the soil of Suffolk was pasture, the amount of draining must have been trifling compared to what has been drained and *redrained* since 1800. From 12 to 20 years has been the usual time for the drains to stand, but lands are frequently drained whilst the former drains are perfectly sound, as newly drained lands carry off the water more quickly, and by cutting across the old drains the land is made still drier.

From 28 to 30 inches has been the usual depth of drains on clay soils ; but on less stiff soils much has been done at 40 inches. Suffolk farmers are surprised at Mr. Smith's recommending "frequent draining" as something new, as all their lands have been frequently drained, and if he means *close* draining, why they have for 50 years *close* drained their lands.

Comparatively speaking, but little extent of springy lands and bogs has been underdrained. Whilst the duty on tiles existed, tiles and soles were 5*l.* per thousand, and it is only of late years that tiles and pipes have been so reduced in price as to induce farmers to use them, and permanently drain their lands in lieu of frequent draining ; nor would they now, but from subsoiling rendering the land more porous, and thus preventing the necessity of redraining.

*Plug Draining.*—As this mode of draining may not be generally known, I shall state the process. It lasts a number of years, and is well suited for those places where economy is necessary, the soil suitable, and a surplus of labourers existing.

A plank shaped to fit the narrow spit-work, half the depth of this spit, 8 or 9 feet long, has two joints, thus separating it into 3-feet lengths, this is to cause the board to pass any little irregularity of the drain, and be more easily drawn forward. An iron is riveted on the end of the board, to which a hook, at the end of a chain 18 inches long, attached to a lever, is fixed ; the lever having a sharp iron on the end, is stuck forward as far as the iron admits in the drain, by the man who stands over the board. The best clay is laid over the board, so as to fill the *narrow spit to the top*, and well rammed down, when the board is drawn forward, but not quite out of the covered drain ; about four removals of the lever draw the board, about 9*d.* per score more is given for plug draining than for common draining, for ramming and drawing the board. Three men form the best gang for plug draining, as the work must be kept close up, lest the clay dry and will not close, or get wet and unfit to use.

#### *Burning Clay for Manure.*

All soils are benefited by the application of clay ashes ; but clay varies in quality, and consequently the quality of the ashes must vary. I have known clay-ashes used on a sandy soil only in one instance, I did not see the effect, but was told the crop was benefited. Where clay-ashes have not been used, it is best to try the effect on a small space, and to give a thick coat. Some clay, I have been told, will not pulverize after being burnt, but I never met with such. Clay containing a large



portion of sand is difficult to burn; the moister such clay is burnt, the less danger of its smothering the fire, and the better the ashes. The ashes of such clay are as good as pure clay ashes; but the sand, or more properly speaking the silex (whether granulated or impalpable), remains the same.

The cost of burning in kilns must be double what it costs to burn in clamps, and is not adapted to general purposes, to the tenant-farmers, the small farmers, and the labourers in their gardens and allotments.

Burning of clay, soda, loam, &c., has been practised in this county for generations, but has been applied in too small quantities to have more than a trifling effect in altering the texture of the tenacious soils where burning earth is most practised. It has been employed as a substitute for other manure, and thus only sufficient is laid on the land to benefit two or three crops.

#### *Improvements required.*

This is a difficult question. That improvements have continually and regularly been proceeding since 1804 is evident, and rapidly of late years. There are soils of all descriptions, shades, and grades, and of farmers also, from the occupiers of 20 acres to 3000; some owners, some leaseholders, and hundreds of tenants-at-will: thus a considerable difference in the state of the lands and buildings.

A comparatively small extent of land may be cultivated to the highest state that the soil admits. The greatest extent probably is improved to the highest state that circumstances allow, viz., the prospect of remuneration, insecurity of tenure, restrictive covenants, and frequent ruinous depreciation of prices.

#### *Miscellaneous.*

*Osiers.*—These occupy so small a space in this county, having been grown only in marshy land, that I should not have noticed their cultivation, had I not found a field of osiers growing on a high-lying *sandy soil*. The crop was 5 or 6 feet high; but I was told they were not fit for white work. I suppose this is a springy running sand, and if so, osiers are the most profitable crop to grow, for I have never found drains to stand many years in a running sand.

*Double Crops.*—Flax has been grown amongst potatoes, and proved a considerable crop for seed.

White carrots seem to be the most promising crop to grow with potatoes, and excellent in case of any return of the potato malady; for if the potatoes are not injured, the carrots may be drawn whilst young, and if the potatoes are affected, the tops may be drawn up before the tubers are diseased, when the tubers, as far as my experience goes, will remain sound, the skins will set, and they will keep till the spring. In this case the carrots will produce a good crop.

Potatoes have been grown with beet, thus:—The beet is grown on a 12-furrow stretch in rows 20 inches apart, with a row of potatoes between each row of beet; a man with a spade begins at the end of a furrow and throws out a hole about half a spadeful, a boy drops a potato in this hole, and the man makes another hole, and with the

mould from this he fills up the former hole; the boy drop another potato, and the work goes on in this manner to the end of the furrow. The potatoes are often a good crop, of some value shipped to London.

*Salt, its uses.*—Few farmers use salt in any way; but all the cattle and sheep should have salt given them two or three times a week, or set salt for them to eat without stint, and all hay and stover stacks should be salted with from 20 to 25 lbs. of salt per ton, and salt should be strewed in the cattle-yards and on the manure heaps.

*Leases.*—The leases in the heavy land are commonly restrictive as to covenants; but few farm strictly according to covenants, except by not growing two white corn-crops following; in fact it is impossible. Seasons will not always admit of ploughing a certain number of times at certain intervals, and few farmers have leases, from one cause or other; some landlords will not give leases, and many farmers will not hire on leases, from the fluctuation of prices and danger of free trade.

*Heavy-land district: in conclusion.*—The palm for improvement since 1800, must certainly be given to this district, the fen district is too small; the sand (especially the eastern) farming was so good then, that there was less room for improvement; but when I consider the then woody state of the heavy-land district (hence the term woodlands) borders a rod wide round every ploughed field, and almost all thickly studded with oak (chiefly pollards) hundreds of years old, and roads almost impassable in winter, I cannot but look with surprise at the altered appearance of the country when I pass through and consider the enormous cost of the labour which has been expended by the *tenantry* in clearing, draining, and breaking up pastures, &c.

The following letters, referring to the several subjects of this Report, will show the state of cultivation, improvements required, &c., in those parts of the county from which they are dated.

No. 3.—Neighbourhood of **HALESWORTH** and **SOUTHWOLD**.

I am indebted for the following communication to J. G. Cooper, Esq., Westwood Lodge, Blythburgh, near Halesworth, who writes that—

“Having been very much engaged, he submitted the questions contained in Mr. Raynbird's letter to three of his agricultural friends; and herewith forwards their answers to the same, distinguishing the opinions of the respective parties by the letters C. G. and S.”

**FIRST QUESTION.**—*The character of the Soils of the County.*

*Answer of C.*—The eastern part of Suffolk consists of a variety of soils, from blowing sand to the strongest clay.

*Answer of G.*—Am not sufficiently acquainted with the county to give an opinion beyond the district in which I reside, which is heavy; and will confine my observations entirely to that description of land.

*Answer of S.*—The soils of the hundred of Wangford are greatly diversified. The Waveney, which separates it on the north from Norfolk, has upon its banks a considerable tract of very fertile marshes;

they are, however, greatly superior at Homersfield, Bungay, and Mettingham, to those in the vicinity of Beccles and Worlingham. Bordering on these is a slope of rich friable loam, slightly mixed with light gravelly spots; commencing at North Cove, it proceeds in a westerly direction to Flixton: beyond this, upon a comparatively high table-land, the character of the soils is that of a strong sandy loam, mostly seated on a clay-marl foundation, and produces under good management excellent root and corn crops. As an exception, the parishes of Ringsfield, Redisham, Weston, and part of Shadingfield, contain some very poor thin-skinned land upon an ordinary brick-earth substratum.

SECOND QUESTION.—*The Management of the Land on the various Soils.*

*Answer of C.*—The blowing sands are frequently laid down with broom and whinseed for sheep-feed, then after 2 or 3 years are ploughed up for wheat, then turnips, afterwards barley; and the good mixed soils are generally cropped after the 4-course shift—first turnips, then barley, the following year clover or peas, and the next wheat. The good deep soil heavy lands are generally cropped in manner following, viz., the greater part of the wheat stubbles are prepared for a root crop; that portion intended for beet is wrought directly after harvest, if the weather permits, in order that it may be forwarded for the beet crop early in the spring; those lands that are for turnips are forwarded as much as possible early in the spring of the year, in order to get them into a good clean state before sowing turnips.

*Answer of G.*—Upon a four-course shift, one-fourth of which is fallowed, and about one-third would receive a ploughing after harvest, and other cultivation, if the weather permits, for the succeeding crop of vegetables, some of which are grown on the ridge, others on the stretch of about 8 feet, and another small portion will be sown with tares and other spring feed; one-fourth barley, drilled; one-fourth beans and clover, beans principally drilled; one-fourth wheat, some dibbled, but principally drilled.

*Answer of S.*—The alternate system of green and grain crops is almost universally practised. Even upon the strong and wet soils the expensive preparation of a long fallow is fast losing ground; mangold-wurzel and the tare are extensively cultivated as fallow crops, and are effecting quite a revolution in the management of this description of soils; drill used for planting corn and roots; corn threshed by machinery.

THIRD QUESTION.—*The Improvement effected in the Farming of Suffolk since the Report of Arthur Young in 1804.*

*Answer of C.*—There is great improvement made in farming since 1804, such as clearing away useless banks and borders, the lands kept cleaner, and underdraining much more general; more stock fattened with linseed-cake and other artificial food, consequently the manure is much better and a larger quantity made.

*Answer of G.*—The breaking up inferior pastures and larger growth of roots, and increase of grazing and consumption of corn and cake, thereby improving quality of manure; cutting down the overgrown old

thorn-fences and many pollard-trees, as well as timber; also a better and more extensive drainage of the land, the general drilling of all crops, thereby enabling the farmer to clean them better (if not cheaper) by horse and hand-hoe, and the use, though to a limited extent, of artificial manure.

*Answer of S.*—A great improvement in draining, manuring, and cropping. The introduction of mangold-wurzel, also better varieties of roots and of grain; the general adoption of the drill for corn and root crops; the use of improved ploughs, scarifiers, drills, horse-hoes, threshing-machines, and a great variety of agricultural implements and machinery; the application of many valuable artificial manures; an increased use of artificial food for fattening; the more general culture of the tare as a fallow crop upon heavy soils.

**FOURTH QUESTION.**—*The Antiquity and Extent of Thorough Draining within the County.*

*Answer of C.*—Under-draining has been in practice for many years, but not so general as at the present time.

*Answer of G.*—Have no knowledge of the history of draining, but it appears to have become general, or a general attention given to it, since 1800; at various distances; at first of 3, 5, to 10 yards apart, but finally settled to about 6 yards, 30 inches deep, filled with bushes, whins, or straw bands; most of the lands have been drained three, four, or five times since that period. There is also a quantity of tile-draining going on at this time.

*Answer of S.*—The antiquity of thorough draining I am unable to discover; in my opinion it is more ancient than many imagine. I find that in 1770 a plough was invented by a Mr. Makyns, a small Suffolk farmer, which in 34 minutes, drawn by 6 horses, cut a drain 660 feet in length, and 18 inches in depth, and was considered very useful for making trenches for close draining. I infer from this that close draining was practised before that period. Most strong soils are now drained, but a great deal at too great a distance from drain to drain: and I question whether half the land in this hundred that requires draining be thorough drained.

**FIFTH QUESTION.**—*The Process of Marling and the Soils benefited thereby.*

*Answer of C.*—Marl is generally carted from pits in different parts of a farm where found, and the soils most benefited thereby are the lighter or sandy soils.

*Answer of G.*—Not having had any experience, can give no opinion of marl. Our new lands generally were clayed from pits sunk to the extent of from 50 to 80 carts per acre; but it has become a practice of late, when draining land requires clay, to throw the top spade about, getting on 50 or 60 carts an acre, at the cost of about 2s. per acre for spreading, which is found (if the clay is good) to benefit materially our fresh lands at little cost.

*Answer of S.*—There is but little marl in this district, and it is mostly

used to form a compost with farm-yard manure. It is sometimes applied at the rate of from 15 to 40 loads per acre to turnip fallows after the first cross-ploughing, or to artificial grass-land after the first crop is removed. Soils of a light character are most benefited by the application. An old writer upon agriculture says—

“He that marls sand  
May buy land;  
He that marls moss  
Suffers no loss;  
He that marls clay  
Throws his money away.”

SIXTH QUESTION.—*The Process of Burning Clay, and the Soils to which it is applicable.*

*Answer of C.*—The most approved plan for burning land is to get it into as good a state as possible by frequent harrowings and rollings; then with hand-rakes get it in small heaps at about 5 yards from each other, every way, and burn the same with straw or furze—the latter is much the best, as the heat will be stronger than from straw. The lands most adapted for such treatment are the deep-soil heavy lands.

*Answer of G.*—The burning of clay is not practised in this county to my knowledge; do not know of a kiln. Our practice is to dig old banks and borders, and turn over the scouring of ditches, and burn and carry for turnips with good effect, if the soil burned was originally good. Clod-burning was also extensively practised on the heavy soils for turnips, and wheat also if the weather permitted, on pea and bean stubbles; but it has not been so much in use of late years, for wheat especially.

*Answer of S.*—Clay-burning is not frequently practised here. Occasionally clay thrown from the ditches is thoroughly dried by being repeatedly turned and exposed to the air, and, with the turf taken from the borders of the ditches, is burned upon large flat heaps. The air is excluded as much as possible during the process: the ashes, mixed with some kind of artificial manure, are usually sown by the drill for the turnip-crop. The practice is beneficial to the strong soils in general. Clod-burning is sometimes practised upon the tender heavy soils with great success, as a preparation for the root-crop.

SEVENTH QUESTION.—*The Improvements still required in the County generally, as to the higher Culture of existing Farms, the reclamation of Waste Lands, and the Condition of the Agricultural Labourer.*

*Answer of C.*—There is little doubt but long leases, with good covenants, would be the best means to induce tenants with capital to still further improve their farms. The agricultural labourers are generally well employed and fairly paid, the wages being very much regulated by the price of flour.

*Answer of G.*—It appears to me necessary for the improvement of the tenant, before embarking his capital still further in the soil, that ex-

tended leases should be granted—12 to 20 years—equitable covenants, and paid for all unexhausted improvements at the end of the lease: that it would be highly advantageous for the landlord to tile-drain such lands as are advisable, charging tenant interest thereon. Improve the homesteads by enlarging, and if necessary allowing the tenant to break up some of the remaining inferior pasture, and by such means increase the growth of roots, and the keeping a larger quantity of stock; raising more manure (by box-feeding, if possible) and bestowing care upon it when made; also the application of artificial manure in addition to the manure now used for roots, the cutting down the still remaining pollard trees and timber, if necessary; a more general use of agricultural machinery, horse-hoeing the crops of roots, beans, and peas, and in some instances wheat and barley. The subject of game-laws, and their operation upon our rural population, as well as poor-laws, also deserve serious consideration.

*Answer of S.*—The condition of the labourer, in a social, moral, and physical point of view, is much improved since 1790. He is now better fed, clothed, and lodged than at that time, and is in the possession of many conveniences to which at that period he was a stranger; but his condition viewed relatively with the improved condition of the upper classes, shows less improvement than he is justly entitled to. There may be some difficulty in tracing all the causes which have produced this unfavourable state of things; at the same time it may safely be inferred that he owes much of it to the unjust restriction imposed upon him by the law of settlement in disposing of his labour.

#### NO. 4.—Neighbourhood of WRENTHAM.

1. *Character of the Soil.*—The soil in this district is exceedingly various, as (often in the same field) being composed of sand and gravelly subsoil, intermixed with portions of good mixed soil, having for its subsoil a red loam, or a mixture of loam and sand. The soil is so various that I do not know a farm of 300 acres of the latter description. In Wrentham and adjoining parishes are also portions of strong heavy land, having clay or yellow brick [pillet] earth for its subsoil.

2. *The Management of the Land, &c.*—They are cultivated invariably under the 4-course system, growing turnips, beet, or carrots, when in fallow, on the lighter mixed soils; on the strong soils a portion of roots only, say from a quarter to one-half of the fallows, with a portion of tares either for soiling on the land, or being fed green in the yards, followed by barley or oats, sown down with clover, &c., or, instead, peas or beans, after them wheat.

3. *The Improvements since A. Young's Report in 1804.*—I think very considerable improvements have taken place since the period of 1804, particularly in the culture for and the management of the root-crop, by the use of various artificial manures, enabling the occupier to keep a much larger head of stock for increasing the quantity as well as improving the quality of his manures, for his succeeding crops.

4. *Draining, &c., in the County.*—The strong and heavy lands in this district have been drained, many of them repeatedly, in the Suffolk mode, viz., from 28 to 36 inches deep, putting in straw, furze, or wood;

and this is done on many farms every eight years with good effect. Tiles, pipes, and stones are used, but not to any extent. Where they have been used on the flat surface of the heavy land they have been found not to answer, the fall for water not being sufficient to keep the drain clear.

5. *The process of Marling, and Soils benefited, &c.*—Marling is but little done in this locality, by reason of the distance it has to be brought. The little that has been done upon the light soils tends to prove that its application to the light and mixed soils would be attended with great benefit.

6. *Process of burning Clay, &c.*—I am not aware that this process has been adopted in this district.

7. *Improvements still required, &c.*—This question embraces a wide field. I think a better mode of hiring and letting land by an equitable system of corn-rent, with a longer term of lease than is now almost general in this district (viz., eight years, with an acknowledged covenant of tenant-right), would be a great means to ensure good and improved cultivation. If an equitable system of corn-rent were adopted, the length of time would follow, because the rent would adjust itself as prices of corn altered, whether high or low; and any system which would ensure good cultivation, the certainty of a tenant being remunerated for his capital invested in improvements, and the labourer constant employment, would unquestionably be a great benefit to all parties concerned, viz., the landlord, the tenant, and the labourer. These great interests being benefited, that of the community at large would follow.


#### No. 5.—Neighbourhood of FRAMLINGHAM.

1. *Character of the Soil.*—I cannot give you a scientific report on this, but it suits me to call it a hazel loam, on a subsoil of clay, brick earth, and spewy sand and gravel.

2. *Management, &c.*—The rule, summer land—barley—beans, peas, or layer—wheat; exceptions to the rule in every possible way, where they have no covenants of course. Preparation of land, wheat-stubble turned in, crossed twice, and ploughed twice on stretch. Some harrow a great deal between the ploughings, but others begin to see that this is labour in vain; and that a rolling before the plough each time, that the horses may walk more evenly, and that ploughing deep is better than carrying rubbish about the land by the harrows.

The above applies to long summer lands, but for beet and swedes the ridge plan is begun after harvest, and laid up high and dry for the winter, and ploughing-in for the frost to act upon the soil, and the seed to be drilled after scuffling or horse-hoeing in the spring. I was at the cattle-show, and I heard that Skirving follows this plan with his swedish turnips. Manure is applied to green crops heavily by some persons, as frequently beet is followed by wheat. But on any lands that sheep can be folded on, to be followed by barley, no cattle-muck is used; but in some cases guano is drilled, or a compost with a deal of maiden earth drilled in. The horse-hoe is gradually creeping in. I wish the lands were brought to 8-furrow work, with whole drill and horse-hoes to follow on these heavy soils. The roots grown are used for bullocks, sheep, cows, and pigs.

3. *Improvements effected since 1804.*—We go nearer to the fences, plough deeper, keep more stock, and spend more money in labour.

4. *Antiquity and extent of Thorough Draining, &c.*—Clay subsoil chiefly drained about 32 inches deep, in the winter generally, but some bottoms will do better in the spring, filled in with furze, straw, or ling. Tiles begin to creep in, and deeper draining talked of. The 32-inch draining is done at about 3s. 6d. a score rods, the distance from 5 to 7 yards. I think of draining a piece of land 4 feet deep, 8 yards apart, with tiles. I shall drain as the furrows go, but usually the furrows are crossed. The common draining appears to stand well  When it was begun here I know not.

5. *The Process of Marling, &c.*—We have no quantity of marl here. Clay is frequently applied to what are called loose-bottomed lands. This is considered useful for wheat. The clay is carted from pits, sometimes raised in barrows by taskwork.

6. *The Process of Burning, &c.*—Clay-burning in clamps I know nothing of. I like the burning of borders, but clod-burning I do not patronise. It is astonishing the breadth burnt in Dennington since harvest, I think barley and wheat stubbles, and they are now all in wheat. Any fresh grass-lands are pared and burned. Rape or swedes, followed by oats or wheat. The ashes good for anything.

7. *Improvements required.*—More money spent upon the land in every possible way; we have very little common or waste land hereabouts. The labourers are paid from 9s. to 10s.; at taskwork, 11s. to 12s. Stock—Down, and Half Leicester and Down sheep principally; Suffolk cows; Scotch and Short-horn bullocks. We are a long way behind the age in the breeding department generally. Length of leases and nature of covenants—leases are an *exception*, not a rule. If there be a lease, it generally is terminable at four, eight, or twelve years—that is, only a lease for four years. The covenants all on one side. Do not touch *my* wood, *my* bushes, *my* banks, *my* brows, *my* game, *my* straw, *my* chaff, *my* colder, *my* muck, *my* hay; pay your rent, and just keep your head above water.

#### No. 6.—Neighbourhood of HALESWORTH.

1. *Character of the Soils, &c.*—Varied; and the remark applies itself, perhaps, as strongly to this as any other county in England.

2. *Management of the Land, &c.*—The 4-course system, or rather 4ths and 8ths, is practised here, the particulars of which may be deduced from almost any Suffolk lease.

3. *The Improvements effected since, &c.*—A large quantity of pasture land has been broken up (a practice which has greatly increased since the passing of the Tithe Commutation Act), the number of *cows* formerly kept has been greatly decreased, and the rearing young stock proportionably diminished. A larger quantity of *sheep* has been kept, a more improved system of grazing has been introduced, and many strong clay soils considerably improved by draining.

4. *The antiquity and extent of Thorough Draining.*—I am unable to reply satisfactorily to this. Various systems of draining have un-



doubtedly been carried on for many years, but of its *origin* I can speak with no correctness. With regard to the *extent* of thorough draining, I think the question must be viewed as a very doubtful one.

5. *The Process of Marling, &c.*—None done here.

6. *The Process of Burning, &c.*—This operation is but partially carried out in this immediate locality; but on the deep-soil lands of Laxfield, Cratfield, Brundish, Dennington, &c. (the finest *corn* district in the county), the system of *clod-burning* is very extensively practised.

7. *The Improvements still required, &c.*—On the part of the landowner—a modification of the covenants (especially affording security to the tenant for unexhausted improvements), the granting longer leases than are customary, and a more general attention to the judicious arrangement and better reparation of farm buildings; on the part of the tenant—a more extended system and effectual method of draining, and a vigilant attention to increase the quantity and perfect the quality of his manures.

*The Reclamation of Wastes.*—This is a consummation much to be desired, and which the Commons Enclosure Act will greatly facilitate.

8. *The Condition of the Agricultural Labourer.*—The poor here are principally supplied either with cottage gardens or allotments, which tend greatly to improve their moral and physical condition. So far at least as regards this district, I think it would not be wrong to report favourably.

#### AGRICULTURAL STATISTICS OF THE COUNTY.

The following valuable statistical information relating to the farming of Risbridge, Thingoe, Blackbourn, Hoxne, and Stow Hundreds, is obtained from practical farmers, competent to give correct information from a long residence in their respective districts. If similar returns had been obtained from the other divisions of the county the subject would have been more complete, but those now selected will be found an example of the agricultural statistics of the county, by which we may trace the amount of capital employed upon the land, the annual produce, and the expenditure required to obtain that produce from the various soils and under the various systems of management practised within the county. The returns might have been drawn up in a tabular form, but I thought it best to leave the reader to draw his own conclusions from the words of my correspondents.

##### 1. *Risbridge Hundred.*

J. F. Snell, Esq., of Hundon, has kindly favoured me with a very complete return, referring more especially to his own parish; he writes as follows:—

“The parish of Hundon is about an average of the heavy-land district of the Risbridge hundred, both as regards the cultivation of the land and the other matters referred to in your questions.

“ The observations which I have enclosed are all and only applicable to the heavy-land district of the whole hundred, and to the past and present time. The future, I think, will be different—for instance, the use of artificial manure is greatly on the increase, for root-crops especially. The 4-course shift of husbandry will not be so prevalent as it has been, and when this is the case six able-bodied labourers to every 100 acres of good heavy land may be well and profitably employed.”

1. Estimated acreage, parish of Hundon :—

|             |   |   |   |   |              |
|-------------|---|---|---|---|--------------|
| Arable land | . | . | . | . | 3,630        |
| Pasture     | . | . | . | . | 560          |
| Wood        | . | . | . | . | 50           |
|             |   |   |   |   | <hr/>        |
| Acres       | . | . | . | . | 4,240 Gross. |

Waste at least 10 per cent. ; and although this may seem a large proportion, I am convinced it is not less, taking into consideration hedges, ditches, borders, buildings, cart-paths, trees, &c. The proportion of land in hedges and ditches only would be about 7 per cent.

2. Size of the farms :—

One, 480 acres ; two, 360 ; two, 300 ; one, 250 ; two, 200 ; two, 150 ; five, 120 ; four, 80 ; four, 50 ; three, 30 ; with eight or ten smaller occupations. The average size of the farms of the heavy-land district are not, I think, quite so large.

3. Tenure upon which the land is held :—

Leasehold in 9 cases out of 10, and from 4 to 16 years.

4. The estimated loss to the landowner and occupier per acre on farms where game is preserved :—

In this parish, nor indeed in this immediate neighbourhood, is the game very strictly preserved ; but I am well acquainted with parishes where it is. The loss to the landlord, *directly*, does not perhaps exceed one-fourth of the annual value, but he gets with his bargain a class of tenantry who have neither means nor inclination to improve the property. He loses the man of substance and intelligence, who takes an interest and a pleasure in the proper cultivation of the land ; and who also, by his example and advice, exerts great influence over the habits and morals of those in his employ, causing a steady, contented, well-disposed, independent labourer, in the room of a poaching, evil-disposed, ignorant, and dissolute pauper. The loss to the tenant, directly and indirectly, is beyond my calculation.

5. The nature of the soil and subsoil :—

Heavy and very tenacious, resting on a clay, a good deal of it inclining to red ; about one-sixth a good loam, resting on a gravel, and in some places on a better kind of clay ; situated in a valley running W. to E. through the village.

## 6. Rent:—

|  | £. | s. | d. |
|--|----|----|----|
| Paid to landowner from 15 <i>s.</i> to 30 <i>s.</i> ; average        | 1  | 0  | 0  |
| Tithe, 6 <i>s.</i> 6 <i>d.</i> ; poor-rates, 4 <i>s.</i> 3 <i>d.</i> | 0  | 10 | 9  |
| Surveyors', county, and other rates                                  | 0  | 1  | 9  |
|  | 1  | 12 | 6  |

7. Average annual expenditure for *manual labour* per acre:—

Of course no certain system can possibly be adopted, but must depend on circumstances. I will give the items, in order that you may see how I arrive at the amount; and any inconsistency that you may discover may perhaps be explained away: any expense not charged, or inserted under the wrong head, you can either add or diminish accordingly.

## Roots, viz. :—

|  | s. | d. | £. | s. | d. |
|--|----|----|----|----|----|
| Filling 20 loads manure from yards                                     | 1  | 6  |    |    |    |
| Carting the same to the heap   | 1  | 6  |    |    |    |
| Stirring it over (once)  | 1  | 0  |    |    |    |
| Filling it a second time, when it will be<br>reduced to about 15 loads | 1  | 2  |    |    |    |
| Unloading on the land  | 0  | 10 |    |    |    |
| Spreading, with lad to part it well                                    | 1  | 2  |    |    |    |
|  |    |    | 0  | 7  | 2  |
| Haulming (wheat stubble) and carting                                   | 2  | 6  |    |    |    |
| 4 Ploughings, 1 marking out on the<br>ridge, and 1 rove or strike      | 11 | 8  |    |    |    |
| 2 Harrowings, and 2 rolls  | 0  | 8  |    |    |    |
| Setting (mangles)  | 1  | 6  |    |    |    |
| Hoeing and singling out, including fur-<br>row-skimming                | 12 | 6  |    |    |    |
|  |    |    | 1  | 8  | 10 |
| Pulling, by women  | 3  | 0  |    |    |    |
| Filling, principally by ditto  | 2  | 6  |    |    |    |
| Carting, 2 <i>s.</i> ; laying-up, 2 <i>s.</i>                          | 4  | 0  |    |    |    |
| Procuring haulm, or straw, and laying-on                               | 1  | 0  |    |    |    |
| Covering with earth, &c.   | 1  | 6  |    |    |    |
|  |    |    | 0  | 12 | 0  |
|  |    |    | 2  | 8  | 0  |

The cultivation of turnips would be about the same expense as that for mangold-wurzel; the planting rather less, the pulling more, as this is always done on heavy land. The cultivation is generally 2 rows on the yard ridge. In planting mangold-wurzel I use a hoe, with a staff 16 inches long, being the distance of one plant from another; by this means the plants do not come up so close together, and are more easily separated.

**Bare fallows :—**

|                                     | <i>s.</i> | <i>d.</i> |
|-------------------------------------|-----------|-----------|
| Haulming the land, and carting      | 2         | 6         |
| 5 Ploughings, and 1 rove or strike  | 11        | 0         |
| Rolling and harrowing               | 1         | 0         |
| Water-furrows, digging corners, &c. | 0         | 6         |
|                                     | <u>15</u> | <u>0</u>  |

**Barley after bare fallows :—**

|   | <i>s.</i> | <i>d.</i> | <i>£.</i> | <i>s.</i> | <i>d.</i> |
|---|-----------|-----------|-----------|-----------|-----------|
| Scarifying, harrowing, drilling, and rolling  | 1         | 6         |           |           |           |
| Water-furrowing, cleaning out, &c.  | 0         | 4         |           |           |           |
| Weeding   | 1         | 6         |           |           |           |
|   |           |           | 0         | 3         | 4         |
| Cutting, &c., stacking, driving away, &c.   | 11        | 0         |           |           |           |
| Thatching, 1 <i>s.</i> 2 <i>d.</i> ; threshing, 9 <i>s.</i> 6 <i>d.</i> ; being more straw than after roots | 10        | 8         |           |           |           |
|   |           |           | 1         | 1         | 8         |
|   |           |           | <u>1</u>  | <u>5</u>  | <u>0</u>  |

**Barley after roots :—**

|   | <i>s.</i> | <i>d.</i> | <i>£.</i> | <i>s.</i> | <i>d.</i> |
|---|-----------|-----------|-----------|-----------|-----------|
| 2 Ploughings  | 4         | 0         |           |           |           |
| Scarifying, harrows, drill, and rolls   | 1         | 6         |           |           |           |
| Water-furrows, &c.; 3 times   | 1         | 0         |           |           |           |
| Weeding   | 1         | 6         |           |           |           |
|   |           |           | 0         | 8         | 0         |
| Cutting, turning, loading, stacking, &c.  | 10        | 0         |           |           |           |
| Thatching, 10 <i>d.</i> ; threshing, 8 <i>s.</i> ; being less straw than after bare fallows | 8         | 10        |           |           |           |
|   |           |           | 0         | 18        | 10        |
|   |           |           | <u>1</u>  | <u>6</u>  | <u>10</u> |

**Clovers :—**

|  | <i>£.</i> | <i>s.</i> | <i>d.</i> |
|--|-----------|-----------|-----------|
| Feed.—Sowing, harrowing, weeding, &c.  | 0         | 1         | 6         |
| Stover.—Sowing, harrowing, weeding, stone-picking                              | 0         | 2         | 0         |
| Mowing, 2 <i>s.</i> 3 <i>d.</i> ; making and stacking, 4 <i>s.</i> 6 <i>d.</i> | 0         | 6         | 9         |
| Pulling stack, 6 <i>d.</i> ; thatching, 1 <i>s.</i>                            | 0         | 1         | 6         |
|  | <u>0</u>  | <u>10</u> | <u>3</u>  |

|  | £.    | s. | d. |
|--|-------|----|----|
| Seed.—Sowing, harrowing, weeding, stone-             | 0     | 2  | 6  |
| picking . . . . .                                    |       |    |    |
| Mowing, making, and stacking . . . . .               | 0     | 7  | 0  |
| Thatching, 1s.; getting into barns, 1s. 6d. . . . .  | 0     | 2  | 6  |
| Cobbing and drawing, 3 bushels per acre, 8s. . . . . |       |    |    |
|  | 1     | 4  | 0  |
|  | <hr/> |    |    |
|  | 1     | 16 | 0  |

The average expenses on the clover will not exceed 10s. per acre, as the quantity of seed grown is small; sometimes manure is applied in the winter, but this cannot often be the case when manure is applied for the bean crop.

#### 7. Beans:—

|   | s. | d. | £.    | s. | d. |
|---|----|----|-------|----|----|
| 1 Ploughing (short days) . . . . .                        | 2  | 6  |       |    |    |
| 4 Harrowings . . . . .                                    | 0  | 6  |       |    |    |
| Dibbling, 3s. 6d.; or drilling, 8d., say half 2 1         | 2  | 1  |       |    |    |
| Water-furrows, bird-scaring . . . . .                     | 2  | 6  |       |    |    |
| 3 Hoeings, 10s. 6d.; weeding, 1s. 6d. . 12 0              | 12 | 0  |       |    |    |
|   |    |    | 0     | 19 | 7  |
| Cutting, 5s. 6d.; carting, stacking, &c., 4s. 6d. . . . . | 10 | 0  |       |    |    |
| Thatching, 1s.; threshing corn, 4s. . . . .               | 5  | 0  |       |    |    |
|   |    |    | 0     | 15 | 0  |
|   |    |    | <hr/> |    |    |
|   |    |    | 1     | 14 | 7  |

If the beans get but 2 hoeings, the scarifier and harrows would mostly have to succeed the bean crop previously to ploughing for the wheat crop. Sometimes 2 ploughings are given, the first very shallow, and well harrowed afterwards. In some cases half a coat of manure is given for the beans, and half a coat for the wheat; and a very good system of husbandry it is, where it is well carried out. On good mixed-soil land the beans or peas are often heavily manured, and not afterwards for wheat; on heavy land the beans, &c., are oftener not manured at all, but the whole is reserved for the wheat crop.

#### Wheat:—

|  | s. | d. | £. | s. | d. |
|--|----|----|----|----|----|
| Manuring the land, where the whole is reserved for this crop, will exceed the expenses on the root-crops, as the carting will be greater, inasmuch as the roots are grown as near home as possible . . . . . | 8  | 4  |    |    |    |
|  |    |    | 0  | 8  | 4  |

|  | s. | d. | £. | s. | d. |
|--|----|----|----|----|----|
| Brought forward . . . .  |    |    | 0  | 8  | 4  |
| 1 Ploughing, 2s. 6d.; 4 harrowings, 6d. . .  | 3  | 0  |    |    |    |
| Dibbling at 7s. per acre, on about one-fifth<br>of the occupation; drilling four-fifths, at<br>9d. per acre; average . . . . . | 2  | 0  |    |    |    |
| Wetting wheat, water-furrows, bird-scaring,<br>striking furrows, digging corners, &c. . . }                                    | 2  | 6  |    |    |    |
|  |    |    | 0  | 7  | 6  |
| Hoeing, 3s.; weeding, 6d. . . . .  | 3  | 6  |    |    |    |
|  |    |    | 0  | 3  | 6  |
| (Harvest) Cutting, carting, and stacking .   | 12 | 6  |    |    |    |
| Thatching, 1s.; threshing, 11s. . . . .  | 12 | 0  |    |    |    |
|  |    |    | 1  | 4  | 6  |
|  |    |    | 2  | 3  | 10 |

It is a rule, in some measure, subject of course to certain contingencies, that whatever may be the price per week for labour preceding the harvest, to pay about that price per acre for cutting an average crop of wheat, when done by those called acre-men. Where the wheat is cut so low as to require no haulming, from two to three shillings per acre more is paid.

**Pasture-land :—**

Average expenditure for labour per acre, 5s. 6d., viz. :—

Mowing, 2s. 6d.; making, 3s. 6d.; carting, 2s.; thatching and pulling stacks, 1s.; weeding, 1s.

Ditto, calculating that half the quantity is fed, 1s. (averaging about 5s.).

The price paid for mowing grass is generally about one day's wages and a half per acre, with or without beer, as the crop may be heavy or light.

8. Price of day-labour per week, 9s.
9. Harvest wages, 10s. per acre, or about 5l. for the harvest.
10. Earnings at piece-work of an able-bodied labourer, 10s. 6d.
11. Rent of cottages, from 2l. 10s. to 4l.

The preceding observations apply to the parish of Hundon, but are applicable, generally speaking, to all heavy land in the Rise-bridge hundred, except as regards clover, the greater part of the land being ill adapted to the growth of that plant; consequently, when seed is attempted to be grown, there is but a small produce, and which requires more labour and entails greater expense per bushel for cobbing, &c., than when a greater quantity is grown.

12. Taking a farm of 400 acres, at the average of the *heavy land* in the whole Hundred, what would be the estimated number of acres and produce :—

|          |   |
|----------|---|
| 35 Acres | Waste (not so great as on smaller occupations).                                       |
| 40 „     | Bare fallows.   |
| 16 „     | Tares; perhaps a little white mustard seed, or rye-grass.                             |
| 10 „     | Turnips or swedes, averaging 10 to 12 tons per acre, or 400 to 500 bushels.           |
| 14 „     | Mangold-wurzel averaging 15 tons per acre.  |
| — „      | Carrots; none, comparatively speaking.  |
| 52 „     | Barley; averaging 5 quarters per acre.  |
| 40 „     | Clover; 1 ton per acre of stover, 4 bushels per acre of seed.                         |
| 30 „     | Beans; 3½ quarters per acre.  |
| 10 „     | Peas; 3 quarters per acre.  |
| 80 „     | Wheat, from 3½ quarters to 4 quarters; sometimes the mangold land is sown with wheat. |
| 28 „     | Oats; 7½ quarters per acre.   |
| — „      | Rye; none.  |
| 45 „     | Permanent pasture; 1 ton.   |

---

400 Acres.

13. The average number of labourers employed on the said 400-acre farm :—

|  |                 |
|--|-----------------|
| Able-bodied men . . . . .                      | 16              |
| Boys: two, 1s.; three, 9d.; three, 4d. . . . . | 8               |
| Women employed, perhaps . . . . .              | 8 for 3 months. |

14. Number of working horses, 14.

There are those who are compelled to farm their lands strictly on the 4-shift course of husbandry, and on poor heavy land, growing but few turnips or mangold-wurzel, who make it a rule to keep no more men than horses; and I do not think they require it.

15. Number of working oxen; none.

16. Flock kept, number and breed :—

On a farm of 400 acres (heavy land) there would be kept about 150 ewes, generally half-breds between a Norfolk and a Down, many thinking them hardier than the South-Down; but the Hampshire Down is a hardy sheep, and I think getting more into notice. Where lambs are kept in preference to ewes, about 200 would supply the place of the 150. I do not mean by this that for every 400 acres of land in this district of the Risbridge hundred 150 ewes are kept; for very many small farmers keep no sheep at all. I do not think there are more than one-half the number kept. One-third of all the ewes kept, I think, are crossed with a Leicester tup; the remainder are either tupped by a Down or half-bred Norfolk ram. Some few tup with a pure Norfolk.

17. Number of lambs sold, age, and average price. Number of sheep fattened, breed, age, and average price and weight when sold :—

All the lambs by the Leicester tup are fatted, that is, none of

the ewe-lambs appear to be left for stock ; one-third of them being killed as fat lamb, and sold from 25*s.* to 30*s.* ; the remaining two-thirds are generally sold in the autumn, to be fatted by others occupying lighter lands, averaging something like 26*s.* per head. The ewe-lambs by the Norfolk and half-bred Norfolk tups are almost invariably saved for breeding purposes. So fond are we in this district of black faces, that they have for a long time been selling at higher prices than any other breed, varying from 26*s.* to 32*s.* But the wether-lambs of the same stock do not sell so well as the wethers of any other breeds, in consequence of their taking a longer time to fatten.

I think, taking the whole of the lambs that are reared in this neighbourhood, of all sorts, not more than one-fourth of them are saved for breeding purposes ; about one-fifth of them, I think, are sold as fat lamb, averaging 5 months ; and the remainder, being rather the larger half, is made into mutton, many of the half-bred Leicesters being fit to kill at 15 months old, weighing from 8 to 9 stones, and selling, out of the wool, from 36*s.* to 42*s.* But the number of sheep fattened in this district is small, and are not often fit to kill until they are 20 or 22 months old, averaging about 40*s.*

|                            |                                  |
|----------------------------|----------------------------------|
| Average weight of ewe wool | . 3 lbs., perhaps a little over. |
| Ditto hog wool             | . 4½ lbs.                        |
| Ditto shearling fat        | 5½ lbs.                          |

18. Number of beasts fattened, &c. &c. :—

Very few fattened, those that are, being mostly barren heifers.

19. Number of cows kept, and breed :—

Not exceeding 6 cows on an average of 400 acres, mostly the polled Suffolk breed.

20. Number of hogs kept, and breed :—

Eight sows, with their pigs, the usual Suffolk breed of black and white.

21. Expenditure for oil-cake and artificial food, annually :—

Most of the peas and beans grown on the farm are consumed on the premises ; and where so done, very little artificial food is made use of besides ordinary barley.

22. Expenditure for artificial manures :—

The expenditure is small, when compared with light-land districts, nine-tenths of what is used being Peruvian guano. In my opinion, so long as it can be bought at about 9*l.* per ton, nothing can compete with it. I think it the cheapest artificial manure we can buy, especially for heavy land, and its use is certainly very much on the increase. It will, I believe, very shortly be largely and generally employed, particularly in the cultivation of all root crops.



*Risbridge Hundred.*—(From another Correspondent.)1. *Acreage* :—

|                                    |        |
|------------------------------------|--------|
| Arable land . . . . .              | 49,145 |
| Pasture, wood, and waste . . . . . | 7,293  |
| Proportion in hedge-rows . . . . . | 2,030  |

Total . . . . . 58,468 acres.

2. *Soil*.—Principally heavy land with a clay subsoil.3. *Tenure*.—Various.4. *Game*.—About three thousand acres of land are injured by game, to the extent of 1*s.* per acre.5. *Rent* :—

|   | Per Acre.                                   | Per Acre.                |
|---|---|--------------------------|
| Rent . . . . .                                  | 20 <i>s.</i> to 22 <i>s.</i> average        | 21 <i>s.</i> 0 <i>d.</i> |
| Tithe . . . . .                                 | 5 <i>s.</i> to 6 <i>s.</i> 6 <i>d.</i> ,,   | 5 <i>s.</i> 9 <i>d.</i>  |
| Poor, county, and other<br>rates, about . . . } | 5 <i>s.</i> ,,                              | 5 <i>s.</i>              |
| Total . . . . .                                 | 30 <i>s.</i> to 33 <i>s.</i> 6 <i>d.</i> ,, | 31 <i>s.</i> 9 <i>d.</i> |

6. *Labour*.—From 26*s.* to 28*s.* per acre.7. *Wages*.—Day wages 9*s.* per week, but very few men work at that price. The general average from 10*s.* to 11*s.* per week, not including harvest.8. *Average Produce of the Hundred, and number of acres annually grown of the various cultivated crops.*

|                              |                      |
|------------------------------|----------------------|
| 1-fourth with wheat at about | 32 bushels per acre. |
| 1-fourth barley ,,           | 40 do. do.           |
| 1-eighth beans ,,            | 28 do. do.           |
| 1-eighth seeds               |                      |

9. *Upon an average Farm of 400 acres would be found* :—

- 16 Labourers.
- 14 Cart-horses, working oxen not being used upon the heavy land.
- 15 score Ewes, half-bred Down and Norfolk.
- 4 Cows.
- 20 fattening Bullocks for the pasture, to be finished with turnips, mangold, bean, meal, and a little oil-cake.

10. *Expenditure for artificial manure and food.*

“But little used in the Hundred.”

*Thingoe Hundred.*1. *Acreage*.—Exclusive of Bury St. Edmunds this Hundred contains upwards of 30,000 acres.

Acres.  
Of which about 24,000 are arable.  
2,400 pasture.  
2,400 wood.  
1,200 waste, or in hedges and ditches.

Total acres 30,000

2. *Soil*.—The soil and subsoil various; the greater portion may be called mixed soil and heavy, some part light and sandy.
3. *Tenure*.—Generally upon leases of from 8 to 12 years' duration.
4. *Size of Farms*.—From 200 to 600 acres; some smaller, a few larger.
5. *Game*.—Game is preserved in almost every parish more or less. The expense to the owner has been estimated at 2*s.* an acre; the loss to the farmer is quite as much.

6. *Rent* :—

|                              | <i>s.</i> | <i>d.</i> |
|------------------------------|-----------|-----------|
| Average rent per acre . . .  | 20        | 0         |
| ,, Tithe ,, . . .            | 4         | 6         |
| ,, Poor-rates per acre . . . | 3         | 0         |
| ,, County and others . . .   | 1         | 6         |

Total . . . 29 0 per acre.

7. *Labour*.—The average expenditure for labour upon arable land is 25*s.* per acre; on pasture 5*s.*
8. *Wages*.—Day wages (1848), men 9*s.*, boys 2*s.* to 4*s.*, and women 4*s.* per week. Wages at piece-work about 12*s.* per week. At harvest time 20*s.*, besides an allowance of malt or beer, amounting to about 4*s.* per week.
9. *Cottage rents*.—From 50*s.* to 80*s.* per annum.
10. *Taking a Turnip-land Farm of 300 acres, 240 arable, as an example of the Hundred, the crops and produce would be as follows* :—

| Acres.  | Produce.             |
|---|----------------------|
| 40 Pasture . . .  | 1 Ton per acre.      |
| 45 Turnips . . .  | 15 Tons ,,           |
| 10 Mangold . . .  | 20 Tons ,,           |
| 5 Carrots . . .   | 12 Tons ,,           |
| 45 Barley . . .   | 36 Bushels per acre. |
| 15 Wheat after carrots or mangold   | 28 ,, ,,             |
| 50 Layers various, of clover sometimes fed and then saved for seed, mixed layers mown for hay, sainfoin mown for hay or seed. |                      |
| 10 Bean or peas . . .   | 28 Bushels per acre. |
| 60 Wheat . . .  | 30 Bushels per acre. |

11. *The number of labourers employed, and the stock kept upon the same farm would be* :—  
14 Men.

14 Boys or women, taking the year throughout, more being employed at weeding-time and at the harvesting of roots than at others.

10 Horses.

— Oxen.

300 Breeding ewes, 240 lambs being sold in the autumn, and 60 kept to supply the place of 60 crones sold. But if sheep are fatted, about 200 ewes only would be kept, and from 200 to 300 sheep would be fatted.

25 to 35 or 40 Bullocks fattened, the number varying with the produce of the roots.

10 Milking cows.

12.—*Expenditure for artificial food and artificial manures annually.*

—About £100 per annum for each.

13. *Sheep.*—The ewes for breeding are principally South-down, and a cross with the old Norfolk; these are tupped with Down or Leicester rams.

The lambs are sold at from four to six months old, at from 16s. to 26s. each. Fattening sheep, the best, forwardest in condition, are sold at 14 months, and nearly all sold before they reach 26 months; their weight varies from 16 to 24 lbs a quarter.

Wool, average weight of Ewe wool . 3½ lbs.

„ „ „ Hog . 6½ lbs.

„ „ „ Shearling fat 6½ lbs.

14. *Cattle.*—Very few bred, mostly a cross between Suffolk and Short-horn; sold at 3 years, weight 50 to 60 stone.

The fattening bullocks are Scotch, Galloways and Highlanders, and Short-horns; they are bought in at the autumnal fairs, and sold fat from March till June following. The weight of the Galloways from 40 to 60 stone (of 14 lbs.), Highlanders from 35 to 50 stone, the Short-horns from 60 to 70 stone.

### 3. *Hoxne Hundred.*

1. *Acreage.*—53,036 acres.

2. *Size of Farms.*—From 25 to 200 acres.

3. *Tenure.*—Many are tenants from year to year, others have leases from 8 to 14 years.

4. *Game.*—We have only one parish where game is preserved so as to commit any damage to crops.

5. *Soil.*—Subsoil a strong clay under a good corn loam, some more friable than others; bordering on the Waveney are a few parishes with some light and mixed soil, with boggy low meadows, but of good quality.

6. *Rent.*—Average-sized farms let from 26s. to 32s. per acre; tithe 8s. per acre.

Taking the Hoxne Union, which does not include the parishes of Kelsale and Carlton, which still belong to the old Hundred, the amount of poor-rates levied in the year ending Lady-day, 1848,

was £11,642 14s. 10d. The County rate being £2057 10d. The gross value of the land is £90,425 7s. 3d.; net £79,301 15s. 2d.

7. *Labour*.—The expenditure on arable land amounts to 25s. per acre, on pasture to 6s. an acre.

Day labour, 1848, 1s. 6d. per day; harvest wages £5 for a month or harvesting. At job-work the men earn from 2s. to 2s. 6d. a day.

8. *Cottage rents*.—From £2 10s. to £4 10s.

9. *Taking an arable farm of 400 acres, the following would be the number of acres of each kind of crop, and the produce.*

|                         | Acres.              | Produce.             |
|-------------------------|---------------------|----------------------|
| Bare fallow . . . . .   | 25 . . . . .        | ..                   |
| Turnips . . . . .       | 30 . . . . .        | 20 Tons per acre.    |
| Swedes . . . . .        | 25 . . . . .        | 16 ,,                |
| Mangold . . . . .       | 20 . . . . .        | 25 ,,                |
| <hr/>                   |                     |                      |
| First course . . . . .  | 100 acres.          |                      |
| Barley—                 |                     |                      |
| Second course . . . . . | 100 acres . . . . . | 44 Bushels per acre. |
| Layers . . . . .        | 65 . . . . .        | 30 Cwt. per acre.    |
| Beans . . . . .         | 25 . . . . .        | 32 Bushels per acre. |
| Peas . . . . .          | 10 . . . . .        | 32 ,, ,              |
| <hr/>                   |                     |                      |
| Third course . . . . .  | 100 acres.          |                      |
| Wheat—                  |                     |                      |
| Fourth course . . . . . | 100 acres . . . . . | 32 Bushels per acre. |
| <hr/>                   |                     |                      |
| Total . . . . .         | 400 acres.          |                      |

10. *Pasture*.—On a farm of the above size there would be 80 acres of permanent pasture.

11. The number of labourers on such a farm would be—

12 Labourers at 9s. a week.  
5 Boys at 5s. a week each.  
3 Ditto at 2s. 6d. each.  
3 Women at 3s. 6d. to 4s. each.

*Horses*.—16 working horses.

#### 4. *Stow Hundred.*

1. *Acreage*.—About 22,000 acres gross. Of this about two-thirds are arable land, one-sixth pasture, one-twelfth wood, and one-twelfth in hedges and ditches.
2. *Size of Farms*.—Quite half are under 100 acres, and not more than 30 over 300 acres, the rest between one and three hundred.
3. *Tenure*.—A great quantity of the land a yearly hire; where there are leases, the terms are 4, 8, and 12, a few 16 years. It occasionally happens that leases express the acreage of each crop the tenant is allowed to grow—a *very silly covenant*!!

4. *Game*.—I should not think there are 400 acres of land in the Stow hundred visibly injured by game.
5. *Soil*.—Variable. The greater proportion of the subsoil clay, a little gravel, no chalk.
6. *Rent*.—The average Rent something under 30s. per acre.  
     Ditto Tithe . . . . . 6s. ,,  
     Ditto Poor-rates vary, much about 2s. per acre.
7. *Labour*.—Day labour, Men . . . 10s. per week.  
     Harvest Wages . . . 20s. ,,  
     At piece-work the men earn about 12s. per week.
8. *Cottage rent*.—About £3 10s. per annum.
9. *Crops*.—The hundred of Stow is chiefly cultivated on the four-course system. The annual average of the different crops being, on a farm of 240 acres—  
     First course, 60 acres, 7½ acres tares.  
     15 acres divided between beet-root, swedes and white turnips, according to the *fancies* or circumstances of the *owner* and occupier.  
     12 acres sown down with trefoil or Italian rye-grass in the previous crop for feed, and afterwards fallow.  
     25½ acres, the remainder bare fallow.  
     Second course, 60 acres—Barley is generally sown on fallow ; a small portion of oats. In a few instances wheat is sown after roots or long fallow.  
     Third course, 60 acres—Divided between red clover, white clover, and trefoil ; and beans and peas, in nearly equal proportions.  
     Fourth course, 60 acres—Invariably wheat.
10. *Labour and Stock*.—On 100 acres of average land.  
     About 4 men and one boy are employed to the hundred acres, the women are only employed during the summer months, and not to any great extent.  
     Horses—About four to the 100 acres, no oxen are worked.  
     Cows—From two to three.  
     Fattening-Bullocks—About three.  
     Sheep—But few are kept in the Hundred.
11. *Artificial food and manure*.—The quantity used in the Hundred is small and in very few places.

#### 5. *Blackbourn Hundred.*

1. Consists of 34 parishes, and contains 66,272 acres. (See White's History of Suffolk.) The average rental of which is about 20s. per acre.
2. *Soil*.—There is much diversity of soil, from heaviest clay to the lightest sand. From my knowledge of the district I would class the quantities of land as under :—

|                           |   |        |   |
|---------------------------|---|--------|---|
| No. 1.<br>acres<br>30,350 | { | 8,000  | acres woods and plantations.  |
|                           |   | 14,000 | do. of light soil, principally on a <i>dry</i> chalk.                           |
|                           |   | 4,350  | do. of low meadow land, inferior in quality, but productive.                    |
|                           |   | 4,000  | do. of sheep-walks, heaths, growing furze, heather or ling, and a little grass. |
| No. 2.<br>acres<br>23,737 | { | 20,737 | do. of good mixed land, on a clay or greatly loam or chalk.                     |
|                           |   | 3,000  | do. of sound upland pastures capable of grazing.                                |
| No. 3.<br>acres<br>12,185 | { | 10,685 | do. of heavy clay land, very tenacious and badly drained.                       |
|                           |   | 1,500  | do. of poor worn-out pastures, wet, and bad herbage.                            |
| <hr/>                     |   |        |   |
| 66,272 acres.             |   |        |   |

Roads would be about 2 per cent., and with waste land about 9 per cent. on the whole of the Hundred.

No. 1.—The arable lands in No. 1 are farmed upon the Norfolk four-course system, excepting that part of it which is very light, and there the layers are allowed to lay two and sometimes three years, which is called the five and six-course system.

No. 2.—The arable lands in No. 2 are cultivated on the strict four-course system, substituting beans and peas occasionally for layer, and oats for barley upon lands that have been recently brought into cultivation.

No. 3.—The arable lands in No. 3 are cultivated upon the Suffolk four-course, which is *wheat, fallow* (but rarely a green crop), *barley*, and on the *layer* shift a moiety with beans, reversing the lands so cultivated the *next round* so as to grow layer but once in eight years on the same land.

*Pasture.*—The pasture and meadow lands in the whole Hundred are badly farmed and much neglected: on the heavy lands a few miserable old half-starved cows are kept. It would be a great honour to the country if these poor pastures were well drained and cultivated as arable lands, as the addition of manure which must arise from the extra production of straw would materially improve other parts of the farm.

The farm premises upon the light-land district are in good and tenantable repair, but where the lands are heavier and the occupation smaller the premises are very inferior and badly arranged. I have also found it the practice, where farms are of good size and the premises and house respectable, that it *commands* the attention of men with *capital* and intelligence, who set an example in the district where they reside, which has, in many instances, done great good.

3. *Labour.*—It takes about a *rent and half* for labour, manual, to cultivate a farm well in this district, and which I believe is applicable to all.

Labour is only redundant (in this Hundred) in the district of small occupations; as much as 2*s.* per week extra is paid on the large occupations, where labour is less plentiful and cultivation more improved. I am not an advocate for emigration, as our best men are those that would leave us—they have more enterprise—and leave us with a lot of lazy rascals who never did and never will like work.

4. *Game*.—The agitation of the game question has very much reduced the quantity of hares and rabbits, that we have not anything to complain of; but we require a *security* against their return, by making hares and rabbits, as other vermin, *killable* by any person, subject to trespass.
5. *Produce*.—It would be difficult to form an average of the produce per acre on the whole; you might arrive at a better conclusion in classing them into three different descriptions of soils: under my heading, I should say, they would produce as under:—  
 No. 1. Wheat, 2 qrs.; Rye, 3 qrs.; Barley, 3 qrs.; Oats, 3 qrs.  
 No. 2. Wheat, 3½ to 4 qrs.; Barley, 5 qrs.; Oats, 6 qrs.  
 No. 3. Wheat, 2½ to 3 qrs.; Barley, 5 qrs.; Oats, 6 qrs.

*Note*.—The conclusion which I have arrived at in dividing the quantities of land in this Hundred into arable, pasture, and woods, is not founded upon any statistical evidence, but merely from an off-hand guess, taken from a bird's-eye view of the parishes at different times.

### Suffolk Leases.

Correspondents, to whom the reader is indebted for information from various parts of the county, having concurred in the opinion that the Suffolk form of leases, as generally drawn up, is a great cause of the slow progress of agricultural improvement; nothing that I can say will bear so forcibly upon the subject as the opinions of several experienced agriculturists, and I shall, therefore, give a short review taken from a former part of this work:—

1. *Mr. Peirson, alluding to the whole county, says*:—"The improvements still required in the county generally as to higher culture of existing farms, mainly depends on some *alterations in the leases*."

2. *From the neighbourhood of Southwold and Halesworth*:—  
*C.* "There is little doubt but long leases with good covenants would be the best means to induce tenants with capital to still further improve their farms."

*G.* "It appears to me necessary for the improvement of the tenant, before embarking his capital still further in the soil, that extended leases should be granted—12 to 20 years—with equitable covenants, and paid for all unexhausted improvements at the end of the lease."

3. *From the neighbourhood of Wrentham*:—"I think a better mode of hiring and letting land by an equitable system of corn-rent, with a

longer term of lease than is now almost general in this district, viz. eight years, with an acknowledged covenant of tenant-right, would be a great means to ensure good and improved cultivation."

4. *From the neighbourhood of Framlingham* :—" Leases are an exception, and not the rule. If there be a lease, it is generally terminable at four, eight, or twelve years—that is, a lease for four years."

5. *From the neighbourhood of Halesworth* :—" Among the improvements still required is a modification of the covenants, especially affording security to the tenant for unexhausted improvements."

6. *Risbridge Hundred* :—" Tenure various."

7. *Thingoe Hundred* :—" Leases from eight to twelve years."

8. *Hoxne Hundred* :—" Many are tenants from year to year, others have leases from eight to fourteen years."

9. *Stow Hundred* :—" A great quantity of the land a yearly hire—where there are leases, the terms are four, eight, and twelve, a few sixteen years. It occasionally happens that leases enforce the acreage of each crop the tenant is allowed to grow—a very silly covenant."

The great proportion of the land in Suffolk being held by a yearly tenancy, or by short leases framed upon the remnants of the old-fashioned and intricate agreements of feudal times, can it be wondered why the land is not cultivated to its full capability, when we consider the fetters which are too often placed upon the actions of the farmers by the want of security and by stringent covenants? Here and there estates let under business-like form of agreement are known by the superior style of cultivation and the condition of the tenantry, but I am sorry to say that these are the exception, and not the rule.

In endeavouring to point out the imperfections of the present agreements between landlord and tenant, I lay myself open to the criticism of the landlord, the lawyer, and the farmer; and as each of these, as a class, hold somewhat different opinions upon the subject, I am certain that the following remarks will not meet with general approbation; but though I may fail in obtaining favour from all parties, I will still endeavour to show that the Suffolk leases do not give *security* to the landlord nor afford that *desideratum*—*security* and scope—for the judicious application of the capital and skill of the tenant, and I think a more simple form of lease would give the latter a larger return from his capital, whilst the property of the former would be progressively increasing in value from the full development of the productive powers of the soil.

Previously to the more general adoption of a business-like form of agreement between landlord and tenant, they must learn that the latter cannot deteriorate the land without injuring himself; it is true a yearly tenancy, or the tail end of our present leases, offers, as a means of protection, the inducement for the farmer to obtain as much from the soil and to return it as little as he possibly can, in order to guard against the increased rent which the land would obtain in the market if a more liberal system of



farming had been practised. But this unprofitable proceeding on the part of the tenant decreases the value of the land, and if he continues in the occupation it materially affects his own income. The tenant knows this to be the case; but he has to make a choice between two evils, and, as it generally happens, he takes the less. If he farms too well, he may have to pay an increased rent for the additional value he has given to the soil by his own exertions and expenditure. Thus even in the hands of the best farmers the land wavers in the scale of production, and this can alone be attributed to the uncertainty of tenure afforded by a short lease or by a yearly hire, which prohibits that improvement which a good farmer annually makes.

These proceedings are well known to be apart from that good feeling which fortunately exists between landlord and tenant, and which is considered by some as better security than that afforded by a lease; but cases occur in which this good feeling fails in the hour of need. The continuance of the tenant-at-will in his occupation, and the safe investment of the tenant's capital whose lease is nearly expired, hang upon a thread—"a difference of opinion, a trifling dispute, the dislike of the steward, a change of ownership, the death of his landlord, the demands of creditors upon the estate, and even his own good farming, may cause that thread to be broken at a moment's notice:" is it to be wondered, therefore, that tenants-at-will and those whose leases are nearly expired are prepared for a notice to quit? therefore they do not add sufficient value to the land to make their removal of any "pecuniary consequence" to the landlord.

The want of *security* is the great fault of our system of letting land; and may I ask the advocates of the system of yearly tenancy and of the genuine Suffolk leases and covenants, whether by them the landlord has *secured*, for a continuance, men of acknowledged skill and capital as tenants, whose exertions through a long term of successful farming have *secured* that increased value to the land, which has been the result in those districts where a different and more liberal system of letting has been adopted? And, again, is the landlord *secured* from a depreciation in the value of the land caused by the bad management during the last years of a lease?

On the other hand, has the tenant *security* for the capital he expends in permanently improving the soil? Has he time within four, eight, or even twelve years to obtain a due return for money thus invested? or is his notice to quit given so long before the expiration of his lease, that he has time to reclaim, with interest, from the soil the amount of capital he has sunk upon it? And on leaving his farm can the tenant say to his landlord—Sir, when I took your farm twelve years ago, I agreed to pay you 20s. per acre for it, it then produced on an average

20 bushels per acre of wheat, 28 of barley, 26 of beans and peas, and about eight tons per acre of roots, and I was able to keep one ewe and rear one lamb per acre. Wheat was about 6s., barley 4s., and I reckoned I made 1l. per acre of my flock; my working expenses amounted to 3l. per acre. I have expended 8l. per acre in draining and making roads and fences, and I think these improvements are still worth their first cost; I have expended 5l. per acre in claying, and I think that 3l. worth of this remains in the soil unexhausted; during the last three years I have expended 6l. per acre in guano and oilcake, and I think there is still 3l. worth of this to be got out of the land; and altogether I find from my books, which I have regularly kept, that I have upwards of 15l. per acre remaining permanently in the soil in drains, roads, and fences, or temporarily in clay, manures, and cultivation: I cannot carry these fixtures away with me; will you take them at a valuation? Or can the tenant say—I have told you the valuation and produce of your farm when I hired it; I have made the above expenditure upon it, and my working expenses amount to 4l. 10s. per acre, but I obtain 40 bushels of wheat, 48 of barley, 40 of beans, 20 tons of roots per acre, and I sell and rear two fat sheep per acre; *markets* are about the *same* as when I took your farm, but it will now let for 30s. per acre, and I cannot see that its increased value arises from any *cause* but from my farming. What am I entitled to *receive* for rendering your property of greater value? Such an inquiry might be made by the tenant at the expiration of his lease, on a notice to quit, or an increase of rent being mentioned to him; but if a trifling difference of opinion existed between the tenant and his landlord, would that attention be paid to his request which its importance demands, and which he is morally, though not legally, entitled to receive?

But if we look upon the other side of the question we shall find the landlord has no more security than the tenant. Can he claim full compensation for any decrease in the value of the soil arising from the acts of his tenant, and which depreciation the covenants and clauses of his lease, stringent as they are, utterly fail to prevent. These covenants may state, as they often do, the number of ploughings, harrowings, rollings, muckings, &c., the land is to receive; the number of acres of wheat, barley, beans, peas, clover, and roots the land is to grow, as well as the number of acres that are to remain in unprofitable fallow; the way the corn is to be cut and threshed, the turnips hoed, and the number of acres of grass cut, the number of rods of ditching and draining annually to be done, the number of sheep and cattle to be kept, and perhaps of labourers also, and various other items contained in that comprehensive though indefinite

term in a "husband-like" manner. These covenants bind the tenant to pursue a course of husbandry which must be considered as near *perfection* as the imperfect nature of man is capable of arriving,—for by the lawyer's pen one system of farming is made applicable to every class of soils, the modern improvements which science is bringing to the aid of agriculture are set at nought, and the farmer is obliged to continue the farming of his forefathers from year to year, until he becomes incapable of understanding or of adopting a better system than the one he has long practised. If the covenants of some of the Suffolk leases are literally adhered to, they allow no scope to an improving farmer, urged on by the improvements of an advancing age, and he must either break through them or seek a farm where his money is more secure and where he has more liberty for the exercise of his abilities.

#### *Cultivation of Hops.*

I am indebted to Mr. James Jannings, of Dagworth, for the following information on the management of hops at and near Stowmarket. These, I believe, include all that are grown in Suffolk, except 23 acres belonging to J. C. Cobbold, Esq., at Foxhall, 15 acres at Mr. Freeman's, Henham, a few small hop-yards in Carlford hundred, in the valley in the southern side of the river Deben, and a few grown here and there in cottagers' gardens.


In the Stowmarket district the hop generally grown is called the Marriott, which is a small but generally speaking a very close, firm, and good hop, its flavour considered excellent, and of late years has been much used, as I have been informed, by the Scotch brewers in making the Edinburgh ale. It is mostly about the price of the East Kents. Lately another hop has been introduced by two or three planters, called the Golding Hop; it is more abundant and larger than the former, but not so firm, although when well cured it is bright in colour and very good. The growth this year varies from 9 to 13 cwt. per acre, which, for this district, is considered an excellent crop:—

|                           | Number of Acres. |
|---------------------------|------------------|
| Haughley parish . . . . . | 30               |
| Dagworth hamlet . . . . . | 29               |
| Onehouse parish . . . . . | 31               |
| Combs . . . . .           | 6                |
| Stowmarket . . . . .      | 40               |

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I do not know that I am quite correct as to the number of acres at Stowmarket; the others are correct, I believe. When

a fresh piece of ground is about to be planted, it is dug two feet in depth, the first sod of mould put below and the lower one on the surface, so that the young shoots may have the best soil to grow in; they should be planted not less than seven feet apart, at right angles, so that look which way you will all the hills are in a straight line. The cuttings to be planted are taken off the hills in the early part of the month of March; a small hole is dug and about a spadeful of manure, or rich mould is better, is put in, and the roots planted, five in number, in a ring thus,  not more than an inch apart from each root: they must not be planted in horse-dung which has not gone through the process of fermentation, as the heat would kill them. When the shoots make their appearance above ground, two small old poles are placed to each hill in a straight line for the vines to climb. In a fine season like the last they will produce 3 or 4 cwt. per acre, but we seldom expect them to do much till the second year, when we hope to reap the fruits of our labour.

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III.—*Memoirs of those Persons who have rendered themselves celebrated either as Agriculturists or as Agricultural Mechanists.*

THE first place, as well as the largest share under this head, no doubt belongs to Arthur Young.

I am indebted to the kindness of the Rev. Henry J. Hasted, Rector of Siclesmere, for the MS. copy of the following very complete memoir of Mr. Young.

There is also an excellent memoir by J. Rodwell, Esq., of Alderton, inserted in the 'Penny Cyclopædia,' under the letter Y, and a very interesting autobiography in the fifteenth volume of the 'Annals of Agriculture,' pp. 152 to 200, dated "From the fire-side of my chamber, December 24, 1790," and which he calls 'A Review of my last Thirty Years.'

But the following will, I believe, be found to contain a very great part of this "review," and all the facts of the memoir in the 'Cyclopædia,' besides a considerable quantity of matter which is not to be found in either of them.

*A Biographical Memoir of ARTHUR YOUNG, Esq., F.R.S., &c., Secretary to the Board of Agriculture (from original documents furnished by his own memoranda).* By T. A. PARIS, F.L.S., M.R.L., Fellow of the Royal College of Physicians, Honorary Member of the Board of Agriculture, &c.

IN recording the life of an individual eminent for his writings or discoveries in philosophy or literature, the biographer is not unfrequently charged by a considerable portion of his readers with having lavished

praise where it was not justly merited, or attached an importance to labours ill according with their intrinsic worth and acknowledged utility. This depends in a great degree upon that natural and inherent diversity of constitution of the human mind, which leads different individuals to appreciate the value of intellectual exertions by very different standards. We are, besides, too much disposed to underrate attainments which we do not ourselves possess, or in the value of whose applications we are not likely to participate; indeed in some instances this feeling is carried to so mischievous an extent, that we are induced to regard the zeal and enthusiasm evinced for particular pursuits as traits of weakness in the individuals in which they occur; and thus the mental, like the corporeal eye, by a species of natural illusion, perceives the cloud which exists within itself as a dark spot in the illuminated object which it contemplates; but I am illustrating an embarrassment which, as the biographer of Arthur Young, I may reasonably hope to escape, for agriculture, above all others, is a branch of human knowledge whose application comes home to the business and bosom of every individual, however humble or exalted may be his station—limited or extended his wants—and diversified his pleasures or occupations; while the successful progress and improvement of this art form a subject of such general and common interest, that I apprehend no individual will withhold his tribute of grateful respect to the memory of an aged and patriotic citizen, who concentrated during a long life all the energies of a most vigorous intellect upon this one grand object, and whose writings will amply justify me in asserting that no individual ever existed, in any age or country, who so widely extended the boundaries and so profitably multiplied the resources of rural economy. “To the labours of Mr. Arthur Young,” says Kirwan,\* “the world is more indebted for the diffusion of agricultural knowledge than to any writer that has yet appeared.”

Arthur Young was the descendant of a respectable family who had resided on their estate at Bradfield Combust, near Bury St. Edmunds, in the county of Suffolk, for more than two centuries; he was born in the house of Mrs. Kennon, the celebrated midwife to Queen Caroline, in Clifford-street, London, on the 7th of September, 1741. His father, the Rev. Arthur Young, D.D., was a Prebendary of Canterbury, Rector of Bradfield Combust, Bradfield St. Clair, and Exning, near Newmarket, and Chaplain to Arthur Onslow, Speaker of the House of Commons; he was an extremely active magistrate, and an intelligent scholar, and is known in the annals of theological literature as the author of a work entitled ‘An Historical Dissertation on Idolatrous Corruptions in Religion,’† and was published in 1734. The first volume of the work was dedicated to Arthur Onslow, the Speaker; the second to the Bishop of Bristol, both of whom stood godfather to his son Arthur. Doctor Young married Anna Lucretia, daughter of John Coussmaker, Esq., of Weybridge, Surrey, in 1725, by whom he had three children—John,

\* Irish Transactions, vol. v.

† This work is quoted by Voltaire; and amongst the documents of Mr. Young, is a complimentary letter, addressed to his father, upon the subject of this publication, from Sir Benjamin Keene, British Ambassador at Madrid.

Doctor in Divinity, Prebendary of Worcester, and Fellow of Eton, who broke his neck while hunting with his late Majesty in 1786; the second child was a daughter, Elizabeth Mary, who died soon after her marriage with John Tomlinson, Esq., of East Barnet, in Hertfordshire; the third was Arthur, the celebrated subject of the present memoir.

Arthur Young received a grammatical education at Lavenham, a school about six miles distant from Bradfield Hall, whither he was sent in 1748; and had not maternal fondness interposed her edicts, he would subsequently have gone to Eton, and from thence to the University to receive an academical education, like that bestowed upon his elder brother. He gave, it is said, very early prognostics of his future eminence, and was much esteemed by his early friends and preceptors as a boy of very superior talents and indefatigable industry. He left school in 1758, and was placed, by the anxious desire of his mother, in the house of Messrs. Robertson, merchants at Lynn in Norfolk, in order that he might be qualified for entering into business with his brother-in-law, Mr. Tomlinson of London. His sister, however, died in the interval, and his father's intention was in consequence relinquished. It has ever been a matter of serious regret with Mr. Arthur Young through life, that the premium paid by his father to the Lynn merchant had not been applied in supporting him at college, when, by taking orders, he might have held the Rectory of Bradfield—a piece of preferment which was afterwards bestowed upon his old preceptor of Lavenham school. Posterity will hardly sympathise with him at this circumstance; his mind was cast in a very peculiar and original mould, and it is a question whether the refinements of literature might not have changed its texture and composition, and repressed that vigour and boldness of thought, and strength of expression, which so prominently characterise his writings, and which break the even surface of his ordinary details with an inequality of feeling which is ever opposed to that insipidity which we so frequently experience in the writings of more polished scholars.

During his residence at Lynn his time seems to have been divided between dancing and reading. He was a young man possessed of more than an ordinary share of personal attractions, and he became so great a favourite with those who knew him, that he was a welcome guest at every entertainment: but the allurements of dissipation never interfered with the more solid pleasures which he derived from study; he read with an unabated avidity every work which he could procure; and as his allowance for pocket-money was but scanty, he determined to augment his resources by the emoluments of authorship, and accordingly, at the age of seventeen, he commenced his literary career by writing a political pamphlet, entitled 'The Theatre of the present War in North America,' for which his London bookseller allowed him a number of books to the amount of ten pounds. Encouraged by this compensation, he sent him several other manuscripts, among which were four novels,\* and he received for each a further supply of books. His father died in 1759; and in the year 1761 he was attacked with a hemorrhage from the lungs,

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\* 'The Fair American;' 'Sir Charles Beaufort;' 'Lucy Watson;' and 'Julia Benson, or the Innocent Sufferer.'

in consequence of which he was ordered by his medical advisers to the hot wells at Bristol. Here his skill in the game of chess brought him in contact with Sir Charles Howard, K.B., with whom he formed an intimate acquaintance, and was offered by him a pair of colours in his own regiment of cavalry; but fortunately his mother, his constant guardian-angel upon these occasions, would not hear of his going into the army, and the favourite scheme was therefore abandoned. In January, 1762, he started a periodical publication under the comprehensive title of 'The Universal Museum;' but upon his soliciting Dr. Johnson to contribute his powerful assistance in its support, he received from the Doctor so strong a persuasion to abandon his intention, that, after the publication of six numbers, he disposed of it to the booksellers. In 1763 he returned from the residence of his uncle in London to his mother at Bradfield Hall, without any prospect of a pursuit, profession, or employment; his whole income, during the life of his mother, arising from a copyhold farm of twenty acres, and producing only as many pounds. She was anxious that he should reside with her; and as the lease of her farm of eighty acres would shortly expire, she urged him in the most affectionate manner to undertake its cultivation—a scheme so much in unison with his taste and wishes, that he did not long hesitate in accepting her proposal, and he embarked as a farmer. Young, eager, and totally ignorant as he then was of every necessary detail, it is not surprising, as he has since said, that he should have squandered large sums under golden dreams of improvement, especially as he connected a thirst for experiment without a knowledge of what it demanded for its success, or what were the fallacies to which it was exposed in the execution. In the following year he commenced a correspondence in the periodical work entitled 'Museum Rusticum.\*' This was his earliest effort in agriculture; and in 1765, by the strong persuasion of the well-known Walter Hart, the tutor of Mr. Stanhope, the son of the celebrated Lord Chesterfield, he collected these letters, and reprinted them under the head of 'Sylvæ,' as an appendix to his new publication of the 'Farmers' Letters'—a work in which he treats of several subjects connected with the farming interests with much ability and success, as on the advantages of a general and extensive exportation of corn, and on the balance of agriculture and manufactures, maintaining that the former ought to flourish to the full cultivation of the land before the latter should take place as articles of commerce.

In this year (1765) he married Miss Martha Allen of Lynn, a lady of a very respectable family, whose sister was the second wife of the celebrated Dr. Burney of Chelsea. She was the great-granddaughter of John Allen, Esq., of Lyng House, in the county of Norfolk, who, according to the Count de Boullainvilliers, was the first person who used marl as a manure in that county. Mrs. Young possessed all the attractions of person, the accomplishments of mind, and the excellence of heart to have rendered her a suitable companion for Arthur Young; but it proved

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\* It is a singular circumstance, that this work contains also the first essay written by Mr. Edgeworth, when he was only nineteen years of age, on the subject of "Wheel Carriages."

to be the very reverse of a happy union. It would ill become one who has enjoyed the pleasures of her society, and the advantages of her friendship, to offer any comment upon the family circumstances that might have occasioned so unfortunate an event; nor is it the business of a biographer, while he canvasses the public claims of a distinguished individual to the gratitude of posterity, to violate that sacred principle of decorum by which an impenetrable veil is so properly thrown over the private occurrences of domestic history. Immediately after their marriage they boarded with his mother at Bradfield. A mixture of families is never calculated to ensure harmony; and a declining purse and the prudent caution of an affectionate mother induced him in the year 1767 to undertake the management of the farm of Samford Hall, in Essex, which consisted of about 300 acres of land. But Fortune is not, as the Roman satirist would make us believe, a deity of our own creation: various unforeseen circumstances and unavoidable embarrassments from want of capital induced him to give 100*l.* to a farmer for taking the estate off his hands; and it is not a little singular that this same farmer, by the advantages of capital, very shortly realised a fortune upon it. It was here, uniting the plough and the pen, that he wrote his work entitled '*Political Essays on the Present State of the British Empire*,' but which was not published until 1772, in one volume quarto. After having thus disposed of Samford Hall, he advertised for another farm, and the knowledge that resulted from viewing the different estates that were on this occasion presented to his notice, furnished him with the materials for his tour, which he called '*The Six Weeks' Tour through the Southern Counties*.' By the advice of his Suffolk bailiff he hired a farm of 100 acres in Hertfordshire; and from viewing it in an uncommonly favourable season, they were both deceived in the nature of the soil. "I know not," says Mr. Young, to use his own energetic language, "what epithet to give this soil: sterility falls short of the idea—a hungry vitriolic gravel,—I occupied for nine years the jaws of a wolf. A Nabob's fortune would sink in the attempt to raise good arable crops, upon any extent, in such a country. My experience and knowledge had increased from travelling and from practice, but all was lost when exerted on such a spot. I hardly wonder at a losing account after Fate had fixed me upon land calculated to swallow, without return, all that folly or imprudence could bestow upon it." It will here be naturally asked why he did not go to land decisively good? He answers the question very satisfactorily:—"It was on account of the houses; for although I saw numerous farms that would have suited well, they had wretched hovels on them."

His '*Six Weeks' Tour*' excited a great sensation in the agricultural community, and numerous and pressing were the applications which he received, both personally and by letter, to undertake journeys through other districts, and to record the result of them upon a similar plan. He was accordingly induced, in the year 1768, to perform a tour through the north of England, during which he collected so much information that the publication occupied four volumes octavo, and so eagerly was it purchased that the first edition was very shortly out of print. In the succeeding year he gave to the public his ideas upon '*The Expediency*



of a Free Exportation of Corn,' a work at which his late Majesty expressed the strongest marks of approbation, as the Archbishop of Canterbury informed his brother, Dr. Young.

In 1770 he proceeded on his eastern tour, during which he formed an intimate acquaintance with John Arbuthnot, Esq., the father to the present Secretary to the Treasury, a circumstance which he always mentioned with pleasure, and his memoranda abound with the strongest expressions of regard and friendship for him. This tour was also published in four volumes octavo. As this was the last of his English tours, and unquestionably the best, I shall beg leave to pause in my narrative, to offer a few remarks upon the character and importance of their composition, and the almost magical influence which they produced upon the agriculture of England; and if it be true that he who can point out and recommend an innocent pleasure is to be esteemed an equal benefactor to mankind with him who makes a useful discovery, I claim for Mr. Young, from the hand of the moralist, an additional laurel to decorate his well-earned wreath of popularity. A taste for agricultural pursuits now became general; and it has been said, and perhaps not without justice, that the writings of Arthur Young produced more individual harm, and greater public good, than those of any other person who had ever written—but the former inconvenience must always attend the introduction of any new system, of general application, that requires prudence and skill for its successful direction. It is difficult to say upon what points his English tours best deserve our commendation—whether for the store of practical agriculture which they present, or for the vast and important information they afford on subjects of political economy. But in forming a just estimate of their intrinsic worth, and in understanding the full nature and extent of the public obligation to their author, it must be remembered that their objects were no less novel than their execution was unexampled. No work in any way approaching them in resemblance had appeared in any country. True it is that numerous journeys had been performed through Great Britain, and various tours had been written, but they were all deficient in the grand and striking excellence which gives such pre-eminence to those of Mr. Young. All former tourists confined their descriptions to towns and seats, as if they had actually floated in the air, without paying any regard to the aspect of the country through which they passed to arrive at them, or the state of agriculture as it existed between the isolated objects of their admiration; and as they had no inducement to quit the high roads, and deviate from the beaten line of country, their descriptions were necessarily characterised by tedious repetition and monotonous dullness. A detailed relation of the practical husbandry which he witnessed, and of the experimental observations of the numerous gentlemen whom he visited during a tour of 4000 miles through a country so limited in extent as that of England, could not fail to bring together a mass of knowledge of the most interesting description; and the able and candid manner in which the defects of each practice and system are portrayed laid the first solid foundation for the permanent improvement of the soil, while the comparative view which he offers of the effects of the different modes of cultivation, as practised in different districts, conveys

instruction to the farmer without the trouble of experiments, and a knowledge of profit and loss without the labour or errors of calculation. His writings have thus diffused through the empire the practices that have been found advantageous in particular places, and local knowledge has become general science; thus, for instance, until the publication of his eastern tour, how extremely circumscribed were the knowledge and practice of Norfolk husbandry! In the same tour he explains the Suffolk cultivation of carrots, and points out the value of that root for sustaining the best breed of farm-horses in the kingdom. He describes, likewise, the cultivation of cabbages, as practised in Yorkshire; the culture, advantages, and immense profits of crops of lucerne; he places, also, in a very striking and satisfactory point of view the unnecessary waste of strength employed in the tillage of the kingdom; he presents to the farming world a notice of the best implements; and to all this he adds much practical information on the important subject of a correct course of crops, on which all preceding writers had been silent. I remember, in a conversation with Mr. Young, his stating to me his impression of this being by far the most useful feature of his tours; and he thought that no circumstance in all his writings had produced so beneficial a tendency as that which had turned the attention of farmers to this very important but neglected point. In fine, these popular works may with much truth and justice be said to have formed a new epoch in the agricultural history of Europe, and to have afforded the grand basis of all the improvements that have been made during the last fifty years. Before this period there was not a publication upon the subject of British agriculture from which we could glean any useful information. If it were necessary to substantiate this assertion, I should remind the reader of a late Lord Chancellor of England, who read every English work he could procure upon the subject of husbandry; but finding, instead of instruction, nothing but folly and contradiction, he committed them all to the flames. In the execution of these writings their spirited author has occasionally relieved the monotony of agricultural subjects with animated descriptions of those objects of elegance and art that adorned the several provinces through which he passed, so that while the internal economy of the earth formed the basis of his works, its external ornaments may be said to have furnished the materials for their embellishment. In the opinion of some contemporary critics this was considered as an objectionable part of the composition—it was denounced as a light, flimsy style, unworthy of the grave and important features with which it ought to harmonize. I protest against the sentence of so churlish a tribunal. Surely the philosopher who raises a solid temple to the genius of cultivation may entwine its pillars with flowers without interfering with the utility of the structure or the simplicity of its design. But what can afford a higher testimony of the intrinsic worth of these works than the avidity with which they have been received? Foreign nations, in common with England, have felt their political importance, for they have appeared in almost every language in Europe; and, by the express command of the Empress Catherine of Russia, they were translated into the language of that country, for the purpose of diffusing a knowledge of practical agriculture, and of encouraging a spirit of enlightened industry over the almost boundless territories of her mighty

empire. His 'Rural Economy' appeared in 1770, and in the same year was published, in two volumes quarto, his 'Course of Experimental Agriculture,' dedicated to the Marquis of Rockingham, "containing an exact register of all the business transacted during five years on nearly 300 acres of various soils, the whole demonstrated in 2000 original experiments." In this work there is certainly much to praise, but at the same time much to reprehend. Mr. Young was truly sensible of its faults, and constantly expressed his regret at having so hastily published it; and in his latter years he made a point of destroying every copy that he could get into his possession. The merits of this work may be said to consist in his efforts to ascertain the real and comparative utility of the broadcast and drill husbandry; in the demonstrations which he produced to prove that a much greater quantity of seed than that which modern writers usually prescribe is in most instances necessary; in his advice respecting a junction of *tillage* and *manure*, showing that the former will never be successful without the latter, and that raising large quantities of manure should be a principal object with the farmer. There is also some important matter with regard to the time of sowing, and on the introduction of *fallow* crops instead of *wasteful fallows*, and on the hoeing both of beans and turnips. In the year succeeding he published that well-known work the 'Farmers' Calendar,' which has passed through ten [twenty\*] editions. At the same time he wrote 'Proposals to the Legislature for Numbering the People.' A third edition also of his 'Farmers' Letters' appeared, with an additional volume, in which he shows the advantages which would accrue to the great landed proprietors by improving their estates; and he observes that in this manner they might so extend their incomes as to render it unnecessary for them to make any application to the ministry for a *place*, or to the city for a *wife*. In 1773 he was elected Chairman of the Committee of Agriculture, in the Society of Arts; and he first proposed their publishing an annual volume of Transactions, a plan which was adopted in 1783. In this year he also published a third edition of the 'Southern Tour,' 'Political Essays on the Present State of the British Empire,' and 'Observations on the Present State of the Waste Lands.' In this latter essay he suggested a plan, as simple as it was original, that would enable a very moderate capital to improve very extensive tracts of waste. Without entering into any details, it may be observed that the leading principle developed in this treatise was to form every year, after the first four or five, a farm of just that size which would let the most readily in the neighbourhood; and, when such farm had been finished and let, to sell it, and apply the product of such sale to the progress of the improvement. Finding at this time that his income was barely sufficient to meet his expenditure, he engaged to report the parliamentary debates for the 'Morning Post:' this he continued to perform for several years; and after the labours of the week he walked every Saturday evening to his farm, a distance of seventeen miles from London, from which he as regularly returned every Monday morning. This was the most anxious and laborious part of his life:—"I worked," says he, "more like a coal-heaver, though without his reward, than a

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\* 1848.

man acting only from a predominant impulse." In 1774 he published 'Political Arithmetic,' a work which met with high consideration abroad, and was immediately translated into several languages. Mr. Young has left a memorandum, which states that he received from his different writings, in the interval between the years 1766 and 1775, the sum of 3000*l*.

The years 1776 and 1777 were occupied by his tour through Ireland, which he commenced under the auspices of the most distinguished noblemen and gentlemen of that country, to whom he carried letters from Lord Shelburne, Mr. Burke, and other persons of distinction in England; on landing at Dublin, he was very politely received by Colonel Benton, who was afterwards Lord Conyngham, the aide-de-camp to Lord Harcourt, then lord-lieutenant, who conducted him to his Excellency's villa at St. Woolstan, and made every arrangement for his tour that might in any way contribute to his comfort or instruction. This celebrated tour was published in 1780, in one volume, quarto; Miss Edgeworth, in her 'Castle Rack-rent,' remarks, that it was the first faithful portrait of its inhabitants; but its claims to patronage were founded upon more solid grounds, its pretensions were of a higher order, and of a very different character from those of an animated and descriptive writer; it presented a vast store of agricultural and political knowledge relative to the cultivation and native resources of that kingdom, which has been the means of ameliorating the condition and of promoting the happiness of the people. Were I to attempt anything like an analysis of this powerful work, time and space would alike fail me; I must therefore rest satisfied with noticing some of its more prominent features. That part of the publication which produced the greatest sensation upon the Government, and effected the most important change in its measures, was his attack upon the bounty paid upon the land-carriage of corn to Dublin, in which he proved the gross absurdity of the measure; and showed that the wretched tillage was at the expense of the richest pasturage in the king's dominions; and with such strength and perspicuity was this position supported, that it carried with it immediate conviction, and in the very first session of parliament, after the publication of this work, the bounty was reduced to one-half, and finally, wholly abolished, by which a saving accrued to the Irish nation of 80,000*l*. a-year! What will posterity say of this country, when they learn all that Mr. Young received for this great and disinterested effort of political acuteness and judgment, was a cold letter of thanks from the Dublin Society. "The future biographer," says Mr. Wakefield, "may be inclined to remark that his country behaved to him as Frederick boasted he had done to Voltaire," he had treated him like a lemon, squeezed out the juice, and then flung away the rind. 'Statistical Account of Ireland,'—vol. i.\*

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\* I have peculiar satisfaction in adducing the testimony of this enlightened writer, because his agricultural and political knowledge enabled him to appreciate the merits of Mr. Young. "Truth," says he, "compels me to declare, although the assertion may reproach my country, that he has been ill-requited for his exertions in her service, and that during the best

Mr. Young also proved, in his masterly observations on the penal code of laws against the Roman Catholics, that they were not laws against the *religion*, but against the *industry* of the country; and his arguments have been frequently quoted both by writers and public speakers, as authority for the repeal of those obnoxious statutes, and his advice to a considerable extent has been followed.

Amongst the manuscripts which he has left, numerous are the letters in commendation of this work, which were written to him by the most eminent men in Europe. Lord Chancellor Loughborough told him, that he had been much struck and delighted with his masterly arguments upon the subject of the corn bounty, adding, "Ireland ought to have rewarded you for so important a service." In the year 1777 he was presented with a medal by the Salford Agricultural Society, inscribed, "For his Services to the Public." After the publication of his 'Irish Tour,' in consequence of a very liberal offer from Lord Kingsborough, he returned to Ireland, in order to inspect and superintend his lordship's estate, and he resided for two years in a house built for his reception at Mitchell's Town, in the county of Cork; owing to circumstances which it would be tiresome to detail, he did not remain much longer than 12 months, and in the year 1779 we find him again quietly settled at Bradfield, having in vain endeavoured to gain his mother's approbation of a plan which he projected of emigrating to America; from this period he gradually extended his scale of husbandry, and with such animation did he enter into the details of his occupation, as to perform the manual operation of ploughing himself. Physiologists have asserted that the energies of the mind are incompatible with the laborious exercise of the body, and that they are operations whose activity bears an inverse ratio with each other. Mr. Young may at least be adduced, as affording an exception to this law; for at the same time that he was thus exerting his physical strength in the occupations of his farm, we find that his mind was engaged in a laborious chemical examination of various soils, and in recording and comparing the results of numerous agricultural experiments on the culture of potatoes, for which the Society of Arts adjudged him their honorary gold medal. This was a feature in the character of Mr. Young that always astonished the agriculturists of France. In the preface to a translation of his works, the author exclaims, "but this person who has written so much, is a *practical farmer*." Mr. Young had become intimately acquainted with Dr. Priestley, at Lord Shelburne's, and had acquired from him a taste for pneumatic chemistry. To a man who had been accustomed to contemplate only the grosser forms of matter, and to consider the phenomena of soils as alone depending upon their texture and density, it is not astonishing that his introduction by Dr. Priestley to a new aerial creation should have excited his wonder and astonishment, and have opened to his view a fresh train of active resource; he had often expressed to his friends the surprise with which he witnessed the address of Priestley, in collecting, transferring, and examining airs; and on

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days of his life, she seems to have been coldly insensible to the value of his indefatigable and important labours."

being asked one day in what experiments he had been engaged, his answer shows how strong an impression the command which he had thus acquired over invisible elements had produced upon him; and it affords at the same time no bad specimen of his terse and humorous style of expression: "I have been engaged in examining airs, to be sure—I have been *washing* fixed air and *hanging it out to dry*." In 1782 we find him busily engaged with a curious controversy with Mr. Capel Lofft, upon the propriety of the county of Suffolk building and presenting the government with a 74-gun ship: the letters were printed in the 'Bury Post,' and were the means of establishing that newspaper in the public estimation. At about this period, Prince Potemkin, the Russian prime-minister, sent three young Russians to be instructed by Mr. Young in the arts of husbandry; and in the following year the Empress Catharine presented him, through the hands of her ambassador, with a magnificent gold snuff-box, together with two rich ermine cloaks, designed as gifts to his wife and daughter.

In 1784 he commenced the publication of his 'Annals of Agriculture,' in which he appeared in the double capacity of editor and author, a work which he continued to the period of his blindness; it extends to 45 vols. octavo, and presents a vast store of information upon subjects of agriculture and political economy. The plan upon which it was conducted was one which ought to have ensured for it more extensive and profitable patronage, for instead of recording anonymous correspondence, it refused admittance to any paper that had not the name and address of its author; it can accordingly boast of communications from the most exalted and enlightened characters in Europe, at the head of whom stands our late most gracious sovereign, George III., who transmitted to Mr. Young for publication an account of the farm of Mr. Duckett, the able cultivator of Petersham,\* which is recorded in the 7th volume of the Annals under the signature of Ralph Robinson. The King regularly read this work as it came out, and he took occasion to thank Mr. Young for the pleasure which he received from its perusal, on the terrace of Windsor; upon which the Queen observed, that his Majesty never travelled without a volume of the Annals in his carriage.

During the absence of Mr. Young on the Continent, it appears that an offensive paper was inserted in the 11th volume, "On the System of the Universe," by the Earl of Oxford, upon reading which the King exclaimed, "What! Are the Annals of Agriculture becoming the vehicle of infidel opinions? If so, one of my strongest supports has failed me." The matter was afterwards explained, and his Majesty expressed himself perfectly satisfied. It deserves notice in this place, that in 1803 the King of Naples became a subscriber, and at the same time sent a Neapolitan to be instructed by Mr. Young in agriculture. Amongst the more valuable communications in this work, we must not pass over unnoticed the "Letters on the present State of Agriculture in

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\* The King often visited the farm of this gentleman; a circumstance which contributed in no small degree to his zeal for agriculture: he used to say that his Majesty's attention to his farm was as dew upon the grass.

Italy," by Dr. Symonds, Professor of Modern History in the University of Cambridge. The papers written by Mr. Young are of the most interesting description, abounding with specimens of his original and beautiful style of writing; whenever he speaks of the pleasure of agricultural pursuits, his pen is inspired; if the strains of Petrarch were modulated by the softness of the breeze and the murmur of the fountain of Valclusa, with equal truth may it be said that the rural writings of Arthur Young breathe all the freshness and participate in the healthy vigour of that occupation which forms the subject of his researches and the theme of his panegyric. I cannot resist the temptation of presenting the reader with a quotation from his "Essay on the advantages of a Farmer's Life:" after contrasting the other pursuits of pleasure, he exclaims, "far different from these is the amusement of the farmer; the perpetual renovation of employment is to him a source of perennial pleasure. To see every object budding into life, at the genial summons of returning spring, while all the colours of reviving nature glow with a lustre excited by the efforts of his industry. The russet landscape stealing into verdure, till every scene is pregnant with delight. Each field, alive with tillage, opening the grateful bosom of the earth to receive the seeds of those innumerable plants which vegetate for the wants or blossom for the pleasures of mankind. To hail the yellow shoots that scatter their pale verdure over the glebe, which each returning sun matures into mellow tints. To eye with rapture the brighter hues that paint the spots where art contends with nature; and the gradations of luxuriant growth that follow the variations that experiment has traced. With warmer suns to see the lawn alive with sheep, or spread with the picturesque labours of the haymaker; the stately oxen varying their march with the heat of the day, now in the vale, then in the shade of some spreading beech, or catching every breeze on the elevation of a hill, while the tinkling of the distant fold closes the eve. To assist with incessant attention the progress of vegetation towards the maturity of harvest,—towards that season of joy; when crowded barns prove insufficient for the increase which art and industry command; when the orchard's loaded branches bid streams nectareous warm the peasant's heart; when

‘Sliding through the sky,  
Pale suns unfelt at distance roll away,’

and gild with their beams another hemisphere: not idle in their absence, the provident husbandman sees his flocks and herds securely sheltered, warmly imbedded, and treated luxuriously with verdant vegetation, even in the chilling blasts of frost and snow. The planter, appropriating the right soil for the beauties of the landscape, marks his barren spots, and the prophetic eye of taste sees refreshing shades thicken over the bleak hills. Then also the properties of your soils demand attention; the laboratory opens its recesses, and gives to wintry darkness the illumination of science. The food of plants and progress of vegetation, and the secret powers by which the ambient air shakes from its breezy wings the wonders of fertility; the chain of hidden fire that connects the vegetation of a plant with the lightning that flashes in the heavens, are

unfolded to him who is curious to fathom the depths of this noble science, that with an endless variety suffers no minute to pass heavily in its progress, but presents, to every cultivated mind, an incessant renovation of never-failing pleasures." Having examined agriculture as a pursuit of life, he proceeds to speak of its merit in harmonizing with the views of a family: "Almost all other occupations that strongly attract the mind, exclude a woman from all participation, and are for that reason, if for no other, perfectly good for nothing; but many of them do more than exclude, for they not only prevent her from associating in the amusements of her husband, but they abridge or prevent those that are properly her own: the question then that remains for an amiable woman to reflect on is, what pursuit will come nearest to her wishes? And is it possible—ye Fair, that a doubt or hesitation can enter your minds? If your happiness depends on that of the man you have taken to your bosom, every argument which calls to him to make the choice calls equally to you to second it; the empire of a virtuous mistress is the magic charm of love—a spell more powerful than all the fables of enchantment—enjoyment scatters the delusion. The silken chain by which the wife must continue her dominion, is spun from the finest thread of feeling that connects congenial bosoms. Gentleness and suavity, cheerfulness and good humour, will make time stand still on your brow, and prove in the eye of that friendship, into which passion can subside, a perpetual renovation of your charms." In 1785 his mother died, for whom he entertained the most sincere affection, and he always mentioned her name with the warmest expressions of gratitude. Posterity too ought in justice to consecrate her memory. It has been somewhere said that celebrated men have more frequently been indebted to the mother than the father, for the formation of that peculiar character upon which their eminence depended. I do not mean to discuss this question, but the present instance certainly countenances such an opinion. Mr. Young owed much to his mother; her fondness and affection rescued him from that barren routine for which he was destined, and directed his mind to the pursuit of agriculture; her anxious solicitude saved him from the vortex of military dissipation, into which he would otherwise have fallen; and her firm and steady advice prevented his emigrating into a foreign land, and thus she preserved for her country one whose writings will shed a lustre on her age for future ages. In 1786 Mr. Young sustained a severe family blow, in the sudden and untimely death of his brother, Dr. John Young, who having borrowed from Lord Hinchinbrooke a spirited hunter, in consequence of his own being out of condition, broke his neck as he was hunting with his late Majesty near Windsor; this event deprived his son of his best friend and patron, and blasted all his future hopes and prospects, for he had been placed by his uncle at Eton, and would have been amply provided for in the Church, as soon as he was of age to hold the preferment.\*

\* "Arthur, his only son, who eventually succeeded him in the Bradfield estate, was born in 1770, and took the degree of B.A. at Trinity College, Cambridge, in 1793. He compiled for the Board of Agriculture, in 1807, 'A General Report on Inclosures;' and in 1808, 'The Survey of the Agriculture of Sussex.' Mr. Young, on more than one occasion, gave



Early in the spring of 1787 he received from Mons. Lazowski, at Paris, the gentleman who had formerly accompanied the two sons of the Duke de Liancourt to England, for the sake of Mr. Young's instructions, a pressing invitation to accompany the Count de la Rochefoucauld in a tour to the Pyrenees. This, says Mr. Young, was touching a string tremulous to vibrate; he had long wished for an opportunity of examining France—the effects of its government—the condition of the farmers and of the poor—the state and extent of the manufactures, with a hundred other inquiries, certainly of political importance; yet, strange as it may seem, not to be found in any French work written from actual observation. Mr. Young, therefore, eagerly accepted the proposal, and having completed the tour, returned to England in the following winter; and here a new scene of bustle presented itself: the wool bill arose, and he was deputed by the wool-growers of Suffolk to support a petition against its passing into a law; a proof, says he, at least that a prophet may sometimes be esteemed in his own country. Upon this occasion he united with Sir Joseph Banks, who was also deputed by the county of Lincoln for the same object. As an account of this bill is to be found amply detailed in the 'Annals of Agriculture,' I shall merely observe in this place, that its object was to prevent wool of British growth from being smuggled to France, this at least was the ostensible and avowed object; but Mr. Young always considered the real wish of the manufacturers was to reduce the price, by laying it under heavy restrictions. He was examined at the bars of the Lords and Commons, and published two pamphlets on the subject; he however only succeeded in moderating some of the more hostile clauses. The zeal which he displayed on the occasion gave great offence to the manufacturers, and Sir Joseph Banks in a letter to him, at about this period, gives him joy at his having been burnt in effigy at Norwich, on so laudable an occasion: on the other hand, he received from the pens of the most eminent political economists, tributes of praise for his manly and disinterested exertions, and a pamphlet was addressed to him upon the subject by Thomas Day, Esq., a gentleman well known as the author of 'Sandford and Merton,' and who has more recently been brought before the public eye by the notice taken of him in the 'Memoirs of Richard Lovell Edgeworth, Esq.' In this pamphlet he says, "If we are delivered from the present danger, I know no one who has so great a claim to the public gratitude as yourself; as soon as the storm began to gather, your active eye remarked the curling of the waters and the blackening of the horizon,

expression to some very singular ideas on politics; and soon after the peace, published a declaration in the newspapers, saying that he had purchased lands in the Crimea, where no tax-gatherer is seen; and inviting his countrymen to emigrate with him to that blissful region.

"He was on his return through Russia, from selling this tract of country, said to amount to 10,000 acres, purchased by him in 1810 (after drawing up 'A Statistical and Agricultural Survey of the Government of Moscow,' by the appointment of Alexander, Emperor of Russia, in 1805), when his death occurred at Kaffa, in the Crimea, September 24th, 1827, in the fifty-seventh year of his age. The Bradfield estate devolved to his sister, Miss Young, the present proprietor."—*Supplement to Kirby*, p. 708.

while every other *Palinurus* was quietly slumbering around; distinguished therefore as you long have been by literary talent, you have now added a nobler wreath and a sublimer praise to all you merited before." In the following July he set out alone on his second journey to France, but he had not proceeded more than 100 miles, before his mare fell blind; not however discouraged by this accident, he travelled with her 1700 miles, and brought her safe back to Bradfield. Still finding that his survey of France was incomplete, he determined to undertake a third expedition, and he accordingly again quitted Bradfield, on the 2nd of June, 1789, in a one-horse chaise, as he had before found it extremely inconvenient to convey specimens of any remarkable soil, of manufactures, and wool, &c. on horseback. During these three tours he passed through every province of France, resided some time at Paris at the Duke of Liancourt's, in the midst of the Revolution; he viewed the greater part of Lombardy, so interesting for its pasturage; and in his first journey he made an excursion into Spain.

In consequence of his health having sustained a severe shock from a fever that attacked him in the autumn of 1790, these travels were not published until the year 1792, when they appeared under the title of '*Travels during the years 1787, 1788, and 1789, undertaken more particularly with a view of ascertaining the Cultivation, Wealth, Resources, and National Prosperity of the Kingdom of France,*' in two volumes quarto. During this interval he made an effort in practical agriculture, which deserves to be recorded on account of its importance; he was the first person who commenced the cultivation of artificial grasses, which he performed by collecting the seed by hand, and sowing it, although the merit of it has been unjustly claimed by others; he introduced more especially the *dactylus glomeratus*, or cock's-foot, and the *cynosurus cristatus*, or crested dog's-tail grass.

His French Travels are superior in style and interest to his Irish Tour; they consist of two distinct parts; the first volume contains his journal, the second a series of essays upon the principal objects that he had observed. His diary is written in a familiar and easy style, and his descriptions are so agreeably circumstantial and unreserved, and constantly enlivened with such smart and unaffected badinage, that the reader becomes one of the party, and cheerfully attends him through his route with all the familiarity of an old acquaintance, participates in all his embarrassments, laughs with him at the follies he witnesses, and partakes of all the amusements, and the agreeable and instructive society to which his celebrity introduced him. I regret that the space allotted for this memoir will not allow the introduction of some copious extracts, in illustration of the terse and agreeable style of his diary. He thus describes a French inn, "They are better in two respects, and worse in all the rest, than those in England; eating and drinking are better beyond a question, and the beds will not admit of a comparison; after these two points all is blank. You have no parlour to eat in; only a room with 2, 3, or 4 beds. Apartments badly fitted up, the walls whitewashed, or paper of different sorts in the same room, or tapestry so old as to be a fit nidus for moths and spiders, and the furniture such that an English innkeeper would light his fire with it; for a table you

have everywhere a board laid on cross-bars, which are so conveniently contrived as to leave room for your legs only at one end; oak chairs with rush bottoms, and the back universally a direct perpendicular that defies all idea of rest after fatigue; doors give music as well as entrance; the wind whistles through their chinks, and hinges grate discord; windows admit rain as well as light, when shut they are not easy to open, and when open not easy to shut." The custom of dining at noon, so common in France, he found to be subversive of all pursuits, except the most frivolous; "we dress for dinner in England with propriety, as the rest of the day is dedicated to ease, to converse, and relaxation; but by doing it at noon too much time is lost. What is a man good for after his silk breeches and stockings are on, his hat under his arm, and his head bien poudré? Can he botanize in a watered meadow? Can he clamber the rocks to mineralize? Can he farm with the peasant and the ploughman? He is in order for the conversation of the ladies, which to be sure is in every country, but particularly in France, where the women are highly cultivated, an excellent employment; but it is an employment that never relishes better than after a day spent in active toil or animated pursuit; in something that has enlarged the sphere of our conceptions, or added to the stores of our knowledge." At Florence he visits the celebrated statue of Venus. "After all I had read or heard," says he, "of the Venus of Medici, and the numberless casts I had seen of it, which have often made me wonder at descriptions of the original, I was eager to hurry to the tribuna, for a view of the dangerous goddess. It is not easy to speak of such divine beauty with any sobriety of language; nor without hyperbole to express one's admiration, when felt with any degree of enthusiasm, and who but must feel admiration at the talents of the artist that thus almost animated marble? If we suppose an original, beautiful as this statue, and doubly animated, not with life only, but with a passion for some favoured lover, the marble of Cleomenes is not more inferior to such life in the eyes of such a lover, than all the casts that I have seen of this celebrated statue are to the inimitable original. You may view it till the unsteady eye doubts the truth of its own sensation; the cold marble seems to acquire the warmth of nature, and promises to yield to the impression of one's hand. Nothing in painting so miraculous as this. A sure proof of the rare merit of this wonderful production, is its exceeding in truth of representation every idea which is previously formed; the reality of the chisel goes beyond the expectancy of the imagination; the visions of the fancy may play in fields of creation, may people them with nymphs of more than human beauty; but to imagine life thus to be fashioned from stone, that the imitation shall exceed in perfection all that common nature has to offer, is beyond the compass of what ordinary minds have a power of conceiving. In the same apartment there are other statues, but in the presence of Venus, who is it that can regard them? They are, however, some of the finest in the world, and must be reserved for another day. Among the pictures, which indeed form a noble collection, my eyes were rivetted on a portrait of Julius II., by Raphael, which if I possessed, I would not give for the St. John, the favourite idea he repeated so often. The colours have in this piece given more life to canvas than

northern eyes have been accustomed to acknowledge. But the Titian! enough of Venus; at the same moment to animate marble and breathe on canvas, is too much. By husbanding the luxury of the sight, let us keep the eye from being satiated with such a parade of charms; retire to repose on the insipidity of common objects, and return another day to gaze with fresh admiration."

The French nation appear to have been duly sensible of the advantages which these travels were calculated to produce upon their agriculture; in a Preface to the translation of his works into the French language in the year 1801, we meet with the following passage:—"There is no person who does not recollect the general and agreeable impression produced in France by the travels of Arthur Young through the various provinces of that vast and rich country, which unites in itself all that a numerous population and the arts can add to the advantages of a climate most happy. National rivalry gave place to admiration at the works of this new Triptolemus, who passed through Europe, for expanding new lights upon an art the most useful to mankind. Geographers and naturalists had already given us a knowledge of the general extent of France, and the dispositions of its basins, which form its principal rivers: but the geponic division of its territory had never been traced in a manner so exact as it has been done by Arthur Young; that indefatigable and penetrating agriculturist has scrutinized it, even to the smallest band of its soil, for determining its nature, and appreciating its value. We see, with sparkling eyes, all the riches which nature has lavished with prodigality, although it is to an Englishman that we are indebted to a knowledge of them."

At this period he commenced a correspondence with General Washington, which was afterwards published in a pamphlet, entitled 'Letters from his Excellency General Washington to Arthur Young, Esq., containing an account of his husbandry, his opinions on various questions in agriculture, and many particulars of the rural economy of the United States.'

This period was also marked by another event upon which Mr. Young always dwelt with pleasure—the present of a Spanish merino ram from the King. "How many millions of men are there," exclaims he, "that would smile if I were to mention the Sovereign of a great empire giving a ram to a farmer, as an event that merited the attention of mankind; the world is full of those who consider military glory as the proper object of the ambition of monarchs, who measure regal merit by the millions that are slaughtered, by the public robbery and plunder that are dignified by the titles of victory and conquest, and who look down on every exertion of peace and tranquillity as unbecoming those who aim at the epithet 'great,' and unworthy of men who are born masters of the globe. But I believe the period is advancing with accelerated pace, that shall exhibit characters in a light totally new; that shall rather brand than exalt the virtues hitherto admired—that shall pay more homage to the memory of a prince that gave a ram to a farmer, than for wielding the sceptre obeyed alike on the Ganges and the Thames." In the early part of the year 1793 he became alarmed at the state of the public mind in this country, and published his cele-

brated pamphlet, entitled 'The Example of France a Warning to Britain.' This was one of the most opportune and successful essays that ever appeared; it was a season of turbulence and terror, and the manly and honest warmth with which he vindicated our national principles, and deprecated those of revolutionary France, which he exposed in all the fulness of their deformity, and in the terrors of their operation, offered an appeal to our best feelings and passions, that was irresistible. The effect was electric; and votes of thanks poured in upon him from every patriotic association in the kingdom. It was to be expected that a writer of such calibre would incur the bitter reproaches of those political partisans who maintained opposite opinions. Mr. Young accordingly has been accused of changing his political principles, and the charge has been supported by the production of passages from his 'Travels in France,' which show him to have been a friend to the Revolution. But hear his own defence.

"The Revolution *before* the 10th of August was as different from the Revolution after that day, as light from darkness; as clearly distinct in principle and practice, as liberty and slavery. For the same man, therefore, to approve of both, he must be either uncandid or changeable; uncandid in his approbation before that period—changeable in his approbation after it. How little reason therefore for reproaching me with sentiments contrary to those I published before the 10th of August! I am not changeable, but steady and consistent; the same principles which directed me to approve the Revolution in its commencement, the principles of real liberty, led me to detest it after the 10th of August. The reproach of changeableness, or something worse, belongs entirely to those who did *not* then change their opinion, but approved the Republic, as they had approved the limited monarchy." It deserves to be here recorded that in this political pamphlet, Mr. Young first recommended a Horse Militia, a force which was afterwards called the Yeomanry Cavalry. He was frequently complimented as the original projector of so valuable a plan, and his health was the first toast drunk at their public dinners. He entered himself as a private into a corps established in the vicinity of Bury St. Edmunds, of which the present Marquis Cornwallis, at that time Lord Broome, was the colonel. Shortly after this period, animated as he always was by the spirit of adventure, he could not resist an opportunity that occurred for realizing the favourite speculation he had so long entertained, that of cultivating a large tract of waste land. He accordingly completed the purchase of 4,400 acres of waste, in Yorkshire. But his fates had decreed other things for him; a new scene of a very different description opened. The Board of Agriculture was established in the August of 1793, and he was immediately appointed its secretary. It has been asserted with much confidence that this situation was given to him by the Government as a reward for his political pamphlet—but this is not true. An individual, it must be granted, is rarely appointed to an official situation on account of his possessing in any eminent degree those qualifications which its duties require; but in the instance of Mr. Young this was undoubtedly the fact; his general and profound knowledge in agriculture was the only circumstance that marked him as the most proper person to fill a

situation in every respect so important and honourable. "The gratification," says he, "of being elected into so important a situation, in which opportunities of still giving an humble aid to the good cause of the plough could scarcely fail of offering, would not permit me to decline the appointment; although to a person established in the country the salary,\* with the residence annexed, was not that pecuniary object which my Jacobin friends have represented, and I must have improved on bad principles indeed, if it would not in a few years have turned out a more profitable speculation. What a change in the destination of a man's life! Instead of entering the solitary lord of 4,000 acres, in the keen atmosphere of lofty rocks and mountain torrents, with a little creation rising gradually around me, making the desert smile with cultivation, and grouse give way to industrious population, active and energetic, though remote and tranquil; and every instant of my existence making two blades of grass to grow where not one was found before—behold me at a desk, in the smoke, the fog, the din of Whitehall. 'Society has charms;—true, and so has solitude to a mind employed. The die, however, is cast, and my steps may still be, metaphorically, said to be in furrow.'"

In the year 1801, by an express order of the French Directory,† his works were translated, and published at Paris, in twenty volumes, octavo, under the title of '*Le Cultivateur Anglais*;' and in the same year, M. du Pradt dedicated to him his work, called '*De l'état de la Culture en France*.' In the year 1794 he engaged with the Board to draw up the County Reports, and accordingly he shortly afterwards published that of the county of Suffolk, and in succession those of Lincoln, Norfolk, Hertford, Essex, and Oxford: these Reports are marked by that same sterling talent, which characterized all his writings. In 1795 he published two political pamphlets, entitled '*The Constitution safe without Reform*,' and '*An Idea of the Present State of France*.' In the following year he paid a very long visit to Mr. Burke, at his seat at Beaconsfield. In 1797 his youngest and favourite daughter died in a decline: this was an event that produced in him a greater shock, and a more remarkable change in his habits and reflections, than any circumstance that had ever occurred.

Death, under any shape, is a terrible monitor: but when he selects his victim from the ranks of youth and beauty, how awful and terrific is his image! From this period Mr. Young began to direct his thoughts to those subjects of religion, the contemplation of which had hitherto been incompatible with the objects of his busy and laborious life; he was now perplexed with many doubts and difficulties respecting the condition of the soul in a future state of existence, and as it was contrary to his active habits of research to remain quietly in doubt upon any subject, until he had applied to every source likely to afford information, he immediately commenced an interesting correspondence with some of our more eminent divines and scholars, and amongst whom

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\* The salary was 100*l.* per annum, with a house free from all charge.

† Said to be chiefly by the advice of the director Carnot, who presented the author with the translation.

the name of the venerable Bryant frequently appears. The publication, however, of Mr. Wilberforce's work on *Practical Christianity* seems to have produced a greater effect in settling his conflicting opinions than any other assistance which he had received, and it established in his mind that true reliance upon divine mercy which gilded the evening of his life, and cheered him in his latter days of darkness and infirmity. But the change thus produced in the habits and opinions of Mr. Young did not repress his ardour for his favourite pursuits; and in the year 1798 he printed a letter, addressed to Mr. Wilberforce, '*On the State of the Public Mind*,' and in 1800 a pamphlet, '*On the Question of Scarcity*.' In the same year he made several tours to ascertain the effects of enclosures, the results of which he published in his '*Annals of Agriculture*.' In 1804 the Bath and West of England Society adjudged their Bedfordian medal to him, for an essay '*On the Nature and Properties of Manures*,' a memoir which contains a vast source of new and valuable facts upon this important subject of agricultural economy. It ought also to be noticed that in this year he received the present of a snuff-box from Count Rostopchin, the celebrated Governor of Moscow, which was turned by himself out of a block of oak, richly studded with diamonds, and bearing a motto in the Russian language, which signifies "From a pupil to his master;" thereby attesting the great services which he had derived from the writings and practices of Mr. Young: over this motto, three cornucopiæ appear, in burnished gold, which are so disposed as to form a cipher of A. Y.

In the year 1805 Novoxiloff, the Russian ambassador, requested Mr. Young to recommend a person who would undertake to survey the government of Moscow, and to draw up a report similar to those which had been published of the English counties. In consequence of this application, the son of Mr. Young immediately proceeded to Russia, and performed the required survey; but on account of the state of exchange between the two countries, he was unable, without a considerable sacrifice, to convey the sum of money which he had received for his labours to England; he was therefore induced to invest it in the purchase of an estate in the Crimea, and upon this spot he has resided ever since. It consists of 10,000 acres of the richest land in the empire of Russia; it was formerly the country-seat of General de Schutz, at which he entertained Catherine and Potemkin, in their progress through the Crimea. The estate is in the vicinity of Karagos, and is fully described by Pallas, in his travels through Southern Russia, as being the first that was regularly cultivated since the occupation of Crim Tartary by the Russians, vol. ii. p. 263.

In the year 1808 Mr. Young was complimented by the Board of Agriculture with a medal of gold, "For long and faithful services in agriculture." Shortly after this period his active pursuits received a severe check from the failure of his eyes: an incipient cataract betrayed itself, and he soon became unable to take his usual exercise; his digestion therefore became disordered, and I have no doubt but that the fatal disease which terminated his existence is to be attributed to this sudden change in his habits. It is a very remarkable fact, that during his whole life, which was blessed with an uninterrupted share of health, he

entertained the greatest horror of two diseases—blindness and the stone, and we find him afflicted with the former at 70 years of age, after an unsuccessful operation in 1811, and that at the advanced period of 80 his life was terminated by the severe sufferings attendant upon the latter. Although his blindness deprived agriculture of an active and laborious investigator, yet the political economist continued to derive from his extensive knowledge and sound judgment most valuable assistance; and he was continually consulted and examined upon various subjects which occupied the attention of Parliament.

The Board of Agriculture also continued to profit by his assistance; he delivered before them a variety of lectures upon the application of manures and the improvement of waste lands, and on other subjects of practical importance, several of which were afterwards published by order of the Board. Nor did he abandon those habits of industry which had ever distinguished him: he rose every morning at 5 o'clock, and regularly heard the different new works read; he was also engaged in preparing for the press an immense work on the Elements and Practice of Agriculture, which contains his experiments and observations made during a period of 50 years. Mr. Young also at this time published select passages from the religious works of Baxter and Owen, in two volumes, duodecimo, under the titles of 'Baxteriana' and 'Oweniana.' Mr. Young possessed a warm and generous heart, and his numerous acts of kindness and benevolence will be long remembered by the grateful inhabitants of Bradfield and the surrounding country. His house was always opened to the distressed, and his counsel and advice were rarely given without an accompanying boon, that might better enable the petitioner to profit by its application. His hall was crowded every Sunday evening with peasants, to whom he read the prayers of the Church of England, and dismissed them with a suitable exhortation. The disease of which Mr. Young died was not suspected until about a week before his death—a circumstance which received a very salutary explanation from an examination of the body after death. He was attended by Mr. Wilson, Mr. Chilver, and myself; and although the incurable nature of his disease defied every hope of permanent relief, yet his sufferings were greatly palliated by the resources of art, and he died without entertaining the least suspicion of the malady under which he suffered. Pious resignation cheered him in his illness, and not a murmur of complaint was heard to escape his lips. On the 12th of April, in the year 1820, at his house in Sackville-street, after taking a glass of lemonade, and expressing himself calm and easy, he expired. His remains were conveyed to Bradfield, and deposited in a vault in the churchyard.\*

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\* His monument is inscribed as follows:—

“ Let ev'ry real patriot shed a tear,  
For Genius, Talent, Worth, lies buried here.

Sacred to the memory of Arthur Young, Esq., born the 7th of September, 1741; died the 12th of April, 1820. In Agriculture, Political Economy, pre-eminent; distinguished for public virtue, private worth, and a strict performance of every moral duty; above all, a faithful but humble disciple of that blessed Redeemer, on whose atoning blood he relied for



I have thus offered a brief sketch of the principal labours of Mr. Arthur Young—a man who filled a large space in the public eye, for a long series of years, but whose name and talents appear to have commanded greater notice and respect in foreign countries than in his own. That he reflected lustre on the age and country in which he lived can be hardly denied; of what other philosopher can it be said, that at one time he entertained under his humble roof pupils of seven different nations, each of whom had been sent to him for instruction by his respective government. I was lately informed by his daughter, that the late Duke of Bedford breakfasted at Bradfield, on one of the mornings of a Newmarket race meeting, and was met by pupils from Russia, France, America, Naples, Poland, Sicily, and Portugal. His numerous works are distinguished by vivacity of thought, quickness of imagination, bias to calculation, and fondness for political speculation; and had they been less successful, posterity might perhaps have regarded these traits of genius as fatal defects, and as frequent sources of fallacy and disappointment.

*What has Arthur Young done for the Nation and for Agriculture?*

IN the following short paper, which has been compiled from the foregoing Life and from an attentive perusal of many of his works, we shall endeavour to show that Arthur Young was not only much before his own age, but before many of the present one; and that not only did he improve the farming of his day, but that our own farming would still be much improved by following his advice.

In his numerous writings we may find most of the (so-called) modern improvements in farming of the day, either plainly pointed out and strongly advocated, or mentioned as in use at that time on various farms. In his numerous experiments and observations, we may also find the germ of many of our scientific theories. Perhaps the fact of his forestalling the modern agricultural writers and improvers in so many of their plans and theories, is the reason that his name is so seldom mentioned by them.

1. Arthur Young strongly advocated the commutation of tithes, either by a corn-rent or a substitution of land: and also the plan of a general enclosure bill, so that the waste lands could be converted, "without those very expensive applications to Parliament which are at present necessary even for the smallest objects." In 1801 he published a work on the application of waste lands to the maintenance and support of the poor. We

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salvation. His natural genius, cultivated talents, and benevolent exertions, were disinterestedly and successfully devoted to the promotion of the statistical and commercial, moral and religious interests of his country. Erected by his affectionate and afflicted son."

have not given much attention to this work, but it is certain that if the wastes and commons had (after allowing sufficient for poor allotments) been considered as a *general fund* for the relief of the destitute poor, there would probably at present be no occasion for poor-rates at all; and that besides relieving those unable to work, they would have given more employment to the able-bodied than they have yet done.

2. Young also greatly advocated agricultural statistical returns by tables on a plain and simple plan. He published, in 1771, 'Proposals for Numbering the People, &c.,' and in his first county report—that of Suffolk, 1797—endeavoured to find the "population and rate of increase or decrease," by writing to all the rectors and vicars of the county, requesting the births and burials from their registers for the last twenty years, with an enumeration of the houses and people. This was four years before Government took the matter in hand; and his 'Proposals, &c.,' long before almost *any Government* considered it worthy of attention.

3. Young was as well aware as the modern writers of the superiority of one-horse carts for harvesting and other farm uses, and advocates them strongly in his 'Annals,' 1784. In his Suffolk Report, he mentions them thus, p. 32: "Waggons are universal in the county: the *modern and greatest of all improvements, one-horse carts* or cars, being, generally speaking, unknown." Again, page 188: "Claying is now done with small one-horse carts, as described in the 'Annals,' at one-third less expense than tumbrils; these carts had three wheels, but being found inconvenient, the third wheel and frame were removed, and a pair of shafts substituted."

4. Earl Ducie, at his example farm in Gloucestershire, has a railroad between his corn-stacks, upon which the sheaves of grain are wheeled in carts into the barn: but Arthur Young exceeded this more than forty years ago; for in his Calendar, 1804, he describes a plan of placing the stacks themselves on a railroad, and dragging them entire to the threshing-barn.

5. As is truly remarked in the foregoing biography, the works of Arthur Young, "if they did not kindle the rising zeal for agricultural improvement, at least gave it a strong *impetus* and blew it into a *vivid flame*."

Whether the 'Museum Rusticum,' to which Young contributed in 1765, was a farmer's magazine is uncertain. If not, Arthur Young's 'Annals' was the first instance of a monthly periodical entirely devoted to farming subjects; it also shows what was done and doing in the year, and kept up the account of the art to its last state of progress.

His agricultural tours were also the first that made agriculture

and statistics the only subjects of research: they may be considered the forerunners of the "County Surveys," of which he was also the originator and principal writer.

His *Calendar*, still a *standard work*, is at the present day equal to any in its class, although not so new an idea as the "Surveys;" for Tusser, another Suffolk farmer, makes the months his measure of division in his 'Hundred Points of Good Husbandry.'

6. He introduced amongst other useful grasses the cock's-foot, *Dactylis glomerata*, and the crested dog's-tail, *Cynosurus cristatus*, and also the method of collecting grass-seeds by hand for the purpose of forming artificial meadows. He also introduced the culture of lucerne—deservedly a favourite, and of chicory, which has deservedly gone out of use.

7. He saw the equal foolishness of bounties to pamper up and of duties to encourage trade or agriculture. Thus, in his Irish tour, 1776, he, by his decided disapprobation of the bounty paid by Government on the land-carriage of corn to Dublin, drew the attention of Parliament to the subject, who soon after abolished it. He equally opposed duties, whether they might be supposed to benefit or injure his own class. Thus, in 1769, he published a work on the expediency of a *free importation* of corn, which met with great approbation in a high quarter; and in 1788 he had the *honour* of being burnt in effigy by the manufacturers of Norwich for having (with others) successfully opposed the bill against the free *exportation* of wool.

8. He warmly supported the claims of the Roman Catholics to the removal of every political disability owing to difference of religion, showing that the penal laws then in force were laws against the industry of the country. In his pamphlet 'The Example of France a Warning to Britain,' 1793, he first recommended a horse-militia, afterwards established under the name of the yeomanry cavalry. But it would be an endless task to enumerate all his services, and we must conclude with the following account, in which the 'Athenæum' for February 22nd, 1845, bears full testimony to their value:—

"The number of contributors to Young's 'Annals,' and the value of a great many of the contributions, clearly show that at the time of its appearance, 1784-5, scientific agriculture attracted great attention in Great Britain. The experiments of the editor, Mr. Young, are of the most diversified kind; in his researches on the food of plants he appears to have brought to the test of his experiments most of those chemical manures which have lately been the subject of attention, together with many others, and particularly several volatile fluids and gaseous bodies. It will be seen by the following extracts from Young's observations on his first published series of these experiments, that he had to a certain extent anticipated Professor Liebig.

“‘Had not inflammable air (hydrogen gas) been tried, the leading feature for selection would have been volatile alkali (ammonia), which is uniformly excellent; and as putrefaction is known in common practice to yield admirable manure, it might have been concluded with great propriety that the volatile alkali was the food of plants—a theory for several years the favourite deduction of my practice.’—*Annals*, vol. i., p. 185.

“It is also worthy of remark that this experimental farmer soon learnt the value of the volatile portions which, under ordinary circumstances, are continually flying off from heaps of putrefying matter; and that he adopted himself and strongly recommended to others the practice of covering up heaps of manure from the sun and air: stating one load of dung in the covered part is worth two in the uncovered, and that he also mixed charcoal with decomposing animal matter for the purpose of fixing this volatile principle. These points have only received general attention since the publications of Liebig and Johnston have particularly shown their value.”

The following complete list of the works of Arthur Young shows that his was a life of industry, perseveringly devoted to the diffusion of information.

1. *The Farmer's Letters to the People of England, &c.* London. 8vo. 1 vol., 1767.
2. *The Farmer's Letters to the Landlords of Great Britain.* London. 8vo., 1771.
3. *A Six Weeks' Tour through the Southern Counties of England and Wales.* 1768–69. 8vo.
4. *Treatise on the Management of Hogs.* London, 1769. 8vo.
5. *A Six Months' Tour through the North of England.* London, 1770. 2 vols., 8vo.
6. *The Farmer's Guide in Hiring and Stocking Farms, &c.* London. 1770. 2 vols., 8vo.
7. *Rural Economy; or, Essays on the Practical Part of Husbandry.* London, 1770. 8vo.
8. *A Course of Experimental Agriculture.* London, 1770. 2 vols., 4to.
9. *The Farmer's Tour through the East of England.* London, 1770. 4 vols., 8vo.
10. *Proposals for Numbering the People.* 1771. 8vo.
11. *Observations on the Present State of the Waste Lands in Great Britain.* London, 1772. 8vo.
12. *Political Arithmetic.* 1774. 8vo.
13. *Tour in Ireland, with General Observations on the Present State of that Kingdom, made in 1776–7–8–9.* Dublin, 1780. 2 vols., 8vo.
14. *An Essay on the Culture of Cole-seed for feeding Sheep and Cattle.* 8vo.
15. *Annals of Agriculture and other Useful Arts.* Published in Numbers. Bury St. Edmunds, 1784 to 1804. 45 vols., 8vo.
16. *On the Wool Question.* 1787. 8vo.

17. *The Example of a Farmer.* 1793. 8vo.
18. *Travels during the Years 1787-8-9*; undertaken more particularly with a View of Ascertaining the Cultivation, Wealth, Resources, and National Prosperity of the Kingdom of France. Bury St. Edmunds, 1792-4. 4to., 2 vols.
19. *General View of the Agriculture of the County of Suffolk*, drawn up for the Board of Agriculture. London, 1797. 8vo.
20. *General View of the Agriculture of the County of Lincoln*, drawn up for the Board of Agriculture. London, 1799. 8vo.
21. *An Enquiry into the Propriety of Applying Wastes to the Maintenance and Support of the Poor.* London, 1801. 8vo.
22. *The Farmer's Calendar*; containing the Business necessary to be performed on the various kinds of Farms during every Month of the year. London, 1800-4. 8vo. 20th edition, edited by John Middleton, in 1836.
23. *Essays on Manures.* 1804. London. 8vo.
24. *General View of the Agriculture of Hertfordshire*, drawn up for the Board of Agriculture. London, 1804. 8vo.
25. *General View of the Agriculture of the County of Norfolk.* London, 1804. 8vo.
26. *General View of the Agriculture of the County of Essex.* London, 1806-7. 2 vols., 8vo.
27. *General Report on Enclosures.* London, 1807-9. 8vo.
28. *General View of the Agriculture of Oxfordshire.* London, 1808. 8vo.
29. *A General View of the Agriculture of the County of Sussex*, drawn up for the Board of Agriculture. London, 1808. 8vo. (This was his son's work.)
30. *Advantages which have resulted from the Establishment of the Board of Agriculture.* London, 1809. 8vo.
31. *On the Husbandry of those celebrated British Farmers, Bakewell, Arbuthnot, and Duckett.* London, 1811. 8vo.
32. *On Money.* London, 1812. 8vo.
33. *Essays on Manures.*—Nicholson's 'Journal,' vol. 23, p. 120; Watt's 'Bibliotheca'; Johnson's 'Farmer's Ency.'

I have inserted the Life of A. Young at so great a length for various reasons. First, because he was so peculiarly connected with this county; secondly, because he was certainly both the most original and the most persevering agricultural writer of this or any other age or country—his whole life having been spent in collecting facts and making experiments on agricultural subjects; and, thirdly, because, even supposing every other account to be lost, his own numerous works and agricultural diaries would afford more materials for such a composition than those of almost any other known writer. The history of Arthur Young is the history of the agriculture of the age he lived in.

I shall be obliged to be very brief in my remarks on other celebrated Suffolk agriculturists, a few paragraphs in Young's works

being often all to be found respecting them ; and our mechanists are generally much more known in their works than in their lives, the latter being as retired and private as the former are renowned. For these machines I beg to refer the reader to Section IV.

Celebrated as Young was as a writer, it is curious to observe how totally unsuccessful he was in all his other undertakings. On his own land, on his mother's, in Essex, in Hertfordshire, he alike failed. Like Tusser, whom I shall next speak of, in teaching others farming and good husbandry, he neglected to practise it himself.

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TUSSER.

Thomas Tusser, styled the British Varro, was born at Rivenhall, near Witham, in Essex, in 1527. Having a fine voice, he was impressed for the Royal Chapel, and sang in St. Paul's under a celebrated musician. He received a liberal education at Eton School, and at Trinity Hall, Cambridge; lived many years as a farmer in Suffolk; and afterwards removed to London, and published his experience in agriculture and gardening. He died in 1580. His work called 'Five Hundreth Points of Good Husbandry, suited to as many of Good Housewifery; with divers approved Lessons concerning Hops and Gardening,' published at London, in quarto, 1573, has been recommended by Lord Molesworth to be taught in schools. The best and latest edition is that of Mavor. Fuller, in his 'Worthies,' thus speaks of him :—

"Tusser was born at Rivenhall, of an ancient family, if his own pen may be believed. Whilst as yet a boy, he lived in many schools—Wallingford, St. Paul's, Eaton, whence he went to Trinity Hall in Cambridge; when a man, in Staffordshire, Suffolk, Northfolk, Cambridgeshire, London, and where not! so that this stone of Sisiphus could gather no moss. He was successively a musician, schoolmaster, serving-man, husbandman, grazier, poet, more skilful in all than thriving in any vocation. He traded at large in oxen, sheep, dairies, grain of all kinds, to no profit. Whether he bought or sold, he lost; and when a renter, impoverish'd himself and never enrich'd his landlord. Yet hath he laid down excellent rules in his book of Husbandry and Housewifery, (so that the observer thereof must be rich,) in his own defence. He spread his bread with all sorts of butter, yet none would stick thereon. Yet I hear no man to charge him with any vicious extravagancy or visible carelessness, imputing his ill success to some occult cause in God's counsel. Thus our English Columella might say with the poet,

————— 'Monitis sum minor ipse meis,'—

none being better at the theory or worse at the practice of husbandry. I match him with Thomas Churchyard, they being mark'd alike in their poetical parts, living in the same time, and statur'd alike in their

estates; both low enough, I assure you. I cannot find the certain date of his death, but collect it to be about 1580."

All that is known of Tusser is gathered from his own poems. His Suffolk residence was in Catwade, a hamlet of Brantham, near Ipswich.

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There is not, that I am aware of, any account of Suffolk agriculturists before Arthur Young's time. I shall therefore first devote a few pages to those persons most noted at that date, and then give a short account of those of the present day.

*The Agriculturists and Machine-makers of the Last Generation.*

Although the Suffolk agricultural mechanists of Arthur Young's time can bear no comparison with those of the present day, yet it may truly be said that many of the Suffolk *agriculturists* were—taking into consideration the change of circumstances, and the fact that agriculture is an improving art—not a whit behind the modern ones. There probably are more good farmers now in Suffolk than there were then, agricultural skill and knowledge being now more diffused and equalised; but the most superior farmers of that day would even now be considered most excellent ones, and they have left us fewer opportunities of improving upon them than many of us are aware of.

I am sorry that I shall in most cases be unable to give more than the mere names of these agriculturists, with a short account of the points they excelled in, collected from Young's Suffolk Report and his other works, and from private sources. And first as to the Suffolk mechanists:—

*Mr. Asbey*, of Blyborough, appears to have been celebrated for his threshing-machines throughout the eastern counties. Mr. Young notes in his Report, 1804, pp. 35, 370, and 395, that—

"Although in 1797 there was not one threshing-machine in the county, yet they are now considerably multiplied, principally by reason of the accuracy with which they have been constructed by Mr. Asbey, of Blyborough, who has made them for the following persons, among many others:—Mr. Press, Wetheringsett; Mr. Freeman, Occold; two for Mr. Howlett, of Westwood; Mr. Gabbeter, Bruisyard; Mr. Fillpot, Walpole; Mr. Moss, Cretingham; Mr. Tye, Sibton, near Yoxford; Mr. Battrum, Hoo, near Wickham Market; Mr. Pipe, Peasenhall; Mr. Manby, Sibton; Mr. Samuel Howlett, Fossington; Mr. Augur, Beccles; Mr. Coates, Hinton, &c. They are worked by three horses. The price of one with a 15-foot wheel, 100 guineas; an 18-foot wheel, 120 guineas; but not including a winnowing-machine. They do the work exceedingly well, and much to the satisfaction of those who have had them. They thresh barley as clean as any other grain, unless the straw is very short

indeed, and then so well that the difference is but trifling. Mr. Reeve and Mr. Howlett thought them in a very great state of perfection. The diameter of the drum-wheel is 4 feet 10 inches, and it moves 130 revolutions in a minute. But Mr. Asbey has lately made a very great improvement in them, at the instigation of Mr. Howlett, by constructing a *moveable machine*, which may be wheeled a mile and set to work in an hour. I saw his first on this construction with much pleasure, as it promises to be equally powerful with the fixed ones, and much more generally useful. It is moveable on wheels to any single stack, and does not demand any building whatever. The price (a winnowing-machine included), 160 guineas.

"1. Mr. Press's threshing-mill requires two men and three boys to work it: 20 coombs of corn an easy day's work. The feeding-board 4 feet wide, and eleven beaters on the drum-wheel. It does not dress.

"2. Mr. Chaplin, of Nedging, has a threshing-mill, the drum-wheel 2 feet diameter, with six beaters, which works with three horses, four men, and one boy, and does 30 coombs of wheat in ten hours. It threshes all grain perfectly clean.

"3. Reeve's, Heverland, Norfolk, built by Asbey, cost 100 guineas, worked with two or three horses: 30 coombs of wheat, or 32 coombs of barley, or 40 coombs of peas."

From a comparison of threshing-machines made at page 170 of Ransome's 'Implements of Agriculture,' it will be seen that, however inferior to the present machines, Asbey's was then worked with less power of men and horses than any there mentioned, and did as much as many of them. The threshing-machine, No. 1, seems, from its large drum and numerous beaters, to have resembled the Scotch; No. 2, in its small drum, &c., the modern English.

*Mr. Cook*, of Halesworth, appears to have been the great drill-manufacturer of that day, and the first to make drills with separate shares, on Baldwin's principle:—

"Mr. Cook makes a variation of his namesake's patent drill machine, in which every share is independent of the rest, for sinking or rising as irregularities of surface may demand. They drill from eight to sixteen rows at a time. The price of the latter, 34*l*. He has been twelve years in the trade, and has made above one hundred of these machines. He has, in the season, from two to four always at work drilling for the farmers by the acre. The husbandry, he says, increases rapidly around Halesworth."—*Suffolk Report*, p. 371.

"Mr. Cook's scarifiers and scuffles are very good tools, and his fixed harrow deserves much commendation, being so contrived that by a diagonal variation in the position in which it is used, one, two, or three teeth may be worked in a 9-inch interval."—*Ibid.* p. 37.

*Brand*, a blacksmith at Lawford, near Manningtree, deserves mention as the inventor of the first iron plough (I have read of none before this), an engraving of which will be found in Section IV. This, called the "Suffolk iron plough," as Kent in-



forms us, was in 1798 used on King George the Third's farms at Windsor.

The modern English plough-head (see Ransome's 'Implementments,' p. 23, for the engraving) was originally, as Young informs us in his 'Eastern Tour,' peculiar to this county, and known as the "Suffolk cathead." In reference to this, Young says, in his 'Suffolk Report,' 1804,—

"A very ingenious blacksmith, named Brand, who has been dead some years, improved the Suffolk swing-plough, and constructed it of iron. I have been informed that the *copse, in its present state*, was an improvement of his. If so, it is much to his credit, for there is no other in the kingdom equal to it."

Young, in his 'Eastern Tour,' 1771, thus mentions this and other inventions of Brand:—

"At the village of Lawford, very near to Manningtree, lives a most ingenious smith, Mr. John Brand, whose mechanical abilities would do honour to a superior station. He has invented various implements of husbandry, of which I have myself had near seven years' experience, and will venture to assert that he has failed in nothing. Among other things, he makes an iron swing-plough, to be drawn by a pair of horses, which much exceeds any plough I have yet seen, in cutting a true regular furrow, well cleared of the loose moulds, or in turning over grass land, at the same time that in strength and duration it is far preferable to all. The ease and simplicity of the variations are excellent. He has also invented other iron ploughs for four and six horses, for ploughing from one to two feet in depth. Another machine, of very great utility, is a horse-rake on wheels, for raking spring corn-stubbles, which performs in a very complete manner, and will in level fields rake hay. Likewise a hand-mill for grinding wheat, which answers, as I have been informed by several persons, exceedingly well. He has made several other tools that have been tried and approved by many farmers. I cannot but recommend this very ingenious mechanic to the attention of the public. He has abilities far superior to the obscurity in which he lives."

*Mr. Hayward*, a blacksmith, of Stoke Ash, near Eye, Suffolk, invented, before 1804, a tool called the extirpator, or scalp-plough, which is engraved in the 'Suffolk Report.' This implement is fixed, by a beam 7 feet long, to the wheels, &c. of a common wheel-plough, and made to go shallow or deep in the same manner. It covers 6 feet of ground, and consists of two bars 12 inches apart, in which are fixed shares 8 inches broad and 9 inches long, fixed to stalks rising 10 inches. The distance between the shares is 11 inches. It is drawn by two or three horses, according to the soil and the depth wanted, and may be used in all lands and by any ploughman.

Its use.—1st. For destroying weeds. All lands overrun with weeds should be worked twice over. Some may possibly require

three times. Some time should elapse for the weeds to die before it is ploughed a second time. 2nd. To prepare land for sowing. The land to be once ploughed over before this instrument is used. If it has lain a summer fallow, it is usually worked over twice with the extirpator—once, 2 inches deep; and secondly 4 inches deep and crossways. This, with running a harrow once over, will both destroy all weeds and render it very fine for drilling or sowing. Lands ploughed in autumn, and intended for spring crops, are thus prepared for seed better than by any other method ever tried. It will easily plough an acre in an hour, and not in the least distress the horses. A farmer mentioned that he could with three horses work up 60 acres per week with it, and that a person having the extirpator may with only three horses farm as much land as would otherwise require six; and, in short, “many farmers who at first ridiculed it, now acknowledge it as the greatest improvement in agriculture they have ever witnessed.” From this account it appears that this “extirpator” was thought very highly of, and much used in saving ploughings at that time. I believe it was the first instance in which the broad hoes were used in scarifiers. There is an improved form of this implement in London’s ‘Encyclopædia of Agriculture,’ p. 405, in which the hoe-stalks are curved instead of straight; the hoes of a different shape; and the carriage, instead of being that of a plough, consists of an axle and the two fore-wheels of a waggon. This extirpator is now wholly superseded by Biddle’s scarifier, in which either broad hoes or chisel-points can be used at pleasure.

*The Rev. Mr. Moseley*, of Drinkstone, was the originator of a mode of husbandry in “ploughing in buck-wheat as a vegetable manure for wheat, after having previously taken a crop of tares for fodder.” This was practised upon a “light sandy soil;” and besides the advantage to the wheat, “the additional profit from the rye as spring feed, which succeeded the wheat, was more than equal to the original price of the buck-wheat.” Mr. Moseley, speaking of buck-wheat as a preparation for barley, says,—

“I think I can point out a method by which it would answer better, and that is by sowing the wheat-stubble with tares immediately after carrying on the muck, and then upon one earth throwing in the buck-wheat.”

Mr. Young, in noticing this plan (‘Suffolk Report,’ p. 88), calls it—

“one of the best imagined arrangements that has been discovered. One ploughing puts in the winter tares; that earth is given in autumn, and consequently opens the soil to the influence of frosts. As the spring advances, and the sun becomes powerful enough to exhale the humidity, and with it the nutritious particles of the land, the crop advances, and

screens it from the action of his beams. Whatever weeds are in the soil vegetate with the young tares, and are either strangled by their luxuriance or cut off with them before they can seed. A crop is gained at a very moderate expense, which is usually worth from 2*l.* to 3*l.* an acre—oftentimes much more. But this crop is cleared so early from the land, that it would remain exposed to the sun through the most burning part of the summer for three months, as that ingenious gentleman rightly observes. If left so, there would be a call for three ploughings to do mischief, except in the point of killing some weeds. To give one earth immediately, and harrow in buck-wheat, spares that expense, and covers the earth when it most wants to be so protected. But a great deal more is done: for according to this comparison, a coat of manure is gained at absolutely no expense; and the year is carried through from Michaelmas to Michaelmas, and three crops put in on only three ploughings, viz. the tares, the buck-wheat, and the wheat. It is not easy to invent a system more complete. Let me go further, and remark that Mr. Moseley in this husbandry is original. Many have sown tares, and many have ploughed in buck-wheat, and most have given a year to each, but it is the combination of the two that forms the merit, and is a plan not before registered; and therefore we are to pronounce, as far as the advancement of the art is concerned, not yet practised.”

*Rev. Henry Hill*, Buxhall, near Stowmarket, was, as we learn from a paper in the ‘Annals of Agriculture,’ called “A Day at Buxhal,” and from the ‘Report,’ p. 362, one of the earliest and strongest advocates for drilling, avoiding spring ploughings on heavy land, scarifying and drilling with the horses going only in the furrows, and *thin seeding*. His wheat on the best soils was drilled in rows 18 inches apart, but the distance was proportioned to the richness of the soil. These wide rows are for the purpose of more complete horse and hand hoeing, which gives considerable tillage, superior cleanness, and prepares it better for the following crop. Mr. Hill’s observations—that his soil (a rich strong loam) was, with the common broadcast husbandry and quantity of seed, extremely liable to be *laid*, and that the drilled crops, however luxuriant, are never laid, the straw being stronger and more in quantity, the free current of air being also of great consequence—agree remarkably with the modern experience of Mr. Davis and other thin sowers. On Mr. Young’s remarking that he should be apprehensive of mildew with such wide spaces, Mr. Hill said that his crops have very rarely been subject to it: he has had none for many years; and that he has generally observed that a thin plant of wheat, from *thick sowing*, is very subject to it, from the land not suiting the crop; but from sowing thin on good land, he never saw the mildew take place more than in thick crops. As I have mentioned Mr. Hill, Mr. Simpson, and others, in their connexion with thin seeding and other points of Tull’s husbandry, in Section I., I shall only add, in reference to this

point, that, as Mr. Poppy informs me, "this thin seeding answered very well for a time, but a mildewing year happening, such thin wheat was good for nothing." The practice was therefore discontinued.

Another grand point in Mr. Hill's system was the putting in a crop, or sometimes a succession of crops, without any ploughing at all—which Mr. Young says "is in clay land novel, and of vast importance"—using the scarifying, drilling, and horse-hoeing system instead. For instance:—

"He has this year (1802) a field of wheat laid at 4 quarters per acre, ploughed in November, 1800, scarified in the spring of 1801, for drilled beans, which produced  $6\frac{1}{2}$  quarters per acre. The bean-stubble scarified, and the wheat now growing drilled. He is clear that the less tillage given for wheat, nine times in ten, the better."

All *spring ploughing* avoided for spring corn, and sow as early as possible; for by ploughing,—

"the land loses a friable surface, and turns up *liver*, which in a drying wind becomes hard as stone, and the more stirred the worse: time and expense lost in clods or mud. He drills barley and oats as early as February, if the weather permit. . . . On his old farm he has not had a summer fallow (esteemed by most of his neighbours absolutely necessary on very strong wet land) these fourteen years past. . . . Tares are a favourite crop with him for soiling horses, cows, &c. As fast as mown, the land is ploughed, and turnips drilled in at 18 inches, which succeed extremely well."

Such are the principal points in Mr. Hill's husbandry. They were not peculiar to him, as the Report mentions several other farmers practising them.

*Dr. Chevallier*, of Aspal, near Debenham, has had his name widely spread as the discoverer of that celebrated variety of barley, the Chevallier, his own account of which, in the Society's Journal, is as follows:—

"An extraordinary fine ear was observed and selected by a labourer of mine, in the parish of Debenham, 1819. In the spring of 1820 I planted 27 grains in my garden. In 1825 I planted half an acre of this species, and half an acre of the common species—the land under precisely similar conditions of cultivation. The produce of the first amounted to  $8\frac{1}{2}$  coombs; of the second,  $6\frac{1}{2}$ . The ears of the first averaged 34 grains; the second, 30: the grains of the first heavier as 4 to 5. In the course of five or six years it was generally accepted and approved in my neighbourhood, as I promoted its fair trial, and charged only the current market-price for it."

There is an excellent account of the management of Suffolk dairies by Mrs. Chevallier (Suffolk Report, p. 204), which is the same as that now practised in those few places in Suffolk where dairying is still carried on.

*Mr. Simpson.*—Mr. Young, in his Report, speaks very highly of “this very sensible and intelligent farmer,” who cultivated, in two farms, 700 acres of land at Witnesham, near Ipswich. From this Report I gather the following points:—

That all his land, and every crop, was cultivated on the drill system; all his crops horse-hoed; and his land laid in 5 feet 3 inch *stetches*, to suit the drill scarifiers and horse-hoes—the wheels of these machines and the horses going in the furrows.

Cabbages were planted in June—one row on his 5 feet 3 inch *stetches*, and 2 feet from plant to plant. On the same land he drills two rows of turnips at 2 feet asunder. Both crops are removed in one-horse quarter-carts—the horse and wheels going only in the furrows, by which poaching the *stetches* is entirely avoided.

He grazes calves of heifers. He had last year four which weighed from 36 to 46 stone each, at fourteen months. They ran with their mothers for ten months, who weighed only 36 or 40 stone at two and a half years old. The breed Suffolk, and the system remarkably profitable.

All his manuring is *with one-horse carts*; and he approves their use so much, that at his Ottery farm, where the implements are new, he has nothing else.

He has drained a great deal: hollow-draining, plug-draining, and, in meadows, with the mole-plough. The general custom is to draw the drains *diagonally across* the slope, but Mr. Simpson draws them with the slope, and he contends that the water has a less distance to percolate to get at his drains than if they were in the usual direction; for supposing them marked a rod asunder, in the first case much of the water would have a rod to flow to reach the drain—in the last, none more than half a rod, as it percolates laterally. “The idea is new.” Mr. Young adds,—

“Mr. Simpson is now in the third year of an experiment on wheat on the Tullian system, induced to do so by reading Tull’s book. In a 6-acre field, wheat is drilled in two rows, 9 inches apart, on 5-foot ridges. In the spring, harrowed the intervals and rows; then horse-hoed with three shares; ploughed two furrows from the plants; hand-hoed the spaces, and ploughed back the earth. After harvest, reversed the ridges, and drilled again in the same manner. The first and second years, the produce 6 coombs per acre.”

Mr. Poppy further informs me that “Mr. Simpson appropriated this field to the growth of wheat, on this Tullian plan, for seven years altogether, and got as much per acre (7 coombs) as at first, but of very inferior quality, deficient in gluten, now well known to be from want of ammonia; and I think he executed 700 miles of under-draining.” Mr. Simpson also box-fed his beasts fifty years since, and forty years since Mr. Poppy saw them so feeding.

*Mr. Edwards*, of Ashbocking, was, as *Mr. Simpson* informed *Arthur Young* in 1803, "the first person in Suffolk who harrowed in broadcast barley on a stale autumnal furrow upon fallow, and his success was such that he continued it himself, and was followed by some of his neighbours. This was about twenty years ago. The next step was to put in beans upon a stale furrow, in which the success was still greater." This makes this practice to date from 1783. It certainly was the first step to the drill husbandry of heavy soils. I am informed on good authority that *Mr. Edwards* had all his land thorough-drained from 1760, from 30 inches to 3 feet in depth, which was originally dug with a frame for the workman to stand upon, to prevent his treading down the shoulders of the drain; and his men used to be borrowed as far as Framlingham, and beyond, by farmers, to teach their men the art.

*Lee Hawes*, of Wetheringsett Lodge, was another first-rate farmer of this period. He also thorough-drained his land about the same time, and was one of the first who used a drill in Suffolk, being in full operation about that time, or soon after, in drilling all his corn, turnips, &c., except that dibbled or sown for experiment, and the turnips moulded up with boards in the hoes the last time, to protect them from the winter's frost; with turnips weighing from 20 to 28 lbs., and drum-head cabbages as heavy. He likewise kept a large dairy of short-horn cows of the most improved breed (following one of the Suffolk breed kept there of one hundred cows), and fattened a considerable number of the breed of oxen in stalls on oilcake and corn, which were driven to London by his own men when fat. He likewise kept breeding ewes of the most improved Downs, and some of *Mr. Bakewell's* improved Leicesters. So highly was the farming of this enlightened agriculturist thought of, that *Arthur Young*, *Mr. Pennington*, *Mr. Freeman*, *Mr. Close*, and most of the foremost agriculturists of the county, repeatedly visited his farm to inspect his proceedings.

*Mr. Charles Poppy*, Witnesham, near Ipswich, a correspondent and contemporary of *Arthur Young*, *Sir John Sinclair*, and the Board of Agriculture, whose lengthened experience is perhaps not equalled by any other Suffolk agriculturist, has given me the following account of some of his inventions:—

"I invented the small triangular iron scarifier some thirty or thirty-five years since, which is now to be seen over Suffolk, Essex, and some parts of Norfolk. *Mr. Arthur Young* prevented me from taking out a patent for it, viz. he advised me not. I also invented the stack-borer, which is now patented, and sold at, I think, 2½ guineas: mine, exactly like it, cost 17.; but I have for many years salted all my hay and stover, which prevents heating. I sent a model of my scarifier to the Board of Agriculture, of which *Sir John Sinclair* was President, with

whom I had much correspondence. He had some of my letters inserted in Scotch papers, respecting protecting the turnip plant from the fly, for which I got the Gold Ceres Medal; and I have pursued the plan, a little improved, ever since. Mr. Spence, who assisted the Rev. Mr. Kirby in writing his book on entomology, called on me a short time since to inquire about it."

*J. Rodwell, Esq.*, of Livermere Parva, near Bury, deserves notice for his great energy in claying and marling land. He had, before 1804, dug and spread 140,000 loads on a not very large light-land farm, and was rewarded by the Board of Agriculture for his Report of his proceedings.

*Mr. W. Macro*, of Barrow, was, in the latter part of the eighteenth century, the foremost breeder of Norfolk sheep; for, as Mr. Young observes of this breed, "the most famous flocks are about Bury much more celebrated than any in Norfolk, it has been observed they ought rather to be called the Suffolk breed." Mr. Macro was one of those examined before the House of Commons on matters connected with wool, and wrote various articles on sheep and on other matters in the '*Annals of Agriculture*.'

#### *Modern Suffolk Agriculturists and Machine-makers.*

A history of the agriculture of Suffolk would be very incomplete if no mention were made of the celebrated agricultural mechanists, Ransome, Garrett, Smyth, Hurwood, &c.

I have taken the following abridged account of Messrs. Ransome and Garrett from Bacon's Prize Essay on the Agriculture of Norfolk:—

"The late Mr. Robert Ransome was born at Wells, Norfolk. He commenced business at Norwich, where he established an iron-foundry; and in 1785 he obtained a patent for making cast-iron plough-shares. He remained in Norwich but a few years, when he removed to Ipswich, where he commenced an iron-foundry business; and in 1803 he obtained a patent for case-hardening cast-iron shares. [See Section IV.] These shares soon came into extensive use, and the demand is increasing at the present day. For a series of years the Ipswich manufactory was carried on alone by Robert Ransome, during which he continued his attention to ploughs and other agricultural implements with comparative success. At length he associated his two sons, James and Robert, with himself, who aided him in his experiments till the year 1825, when he retired. Ransome's foundry has now become one of the largest as well as the most eminent for agricultural implements in the world, and is carried on by James and Robert, with James Allen Ransome, the eldest son of James, who is well known not only as a most active and intelligent exhibitor at the agricultural meetings, but also as a highly gifted and equally esteemed individual, exemplified by his work on the '*Imple-*

ments of Agriculture,' and his general intellectual attainments. With these gentlemen is joined Mr. Charles May, an engineer of repute."

Mr. Ransome thus speaks of this firm in page 17 of the 'Implements of Agriculture':—

"Of those persons whose ingenuity, spirit, and perseverance have enabled them, through many opposing difficulties, to effect improvements in implements of agriculture, I desire to make, though briefly, the honourable mention they deserve. Of this class I have already named Foljambe, Small, Wilkie, and Finlayson; and although I may be thought to have the partial feeling which attaches me to one I loved and honoured in his day, yet I cannot on that account forbear also to mention the late Robert Ransome, my grandfather, who commenced, about sixty years ago, a series of experiments in reference to implements of agriculture, which he carried on with determined perseverance till he accomplished the object he had in view."

*The Messrs. Garrett.*—The grandfather of the present proprietor was a smith by trade, and carried on a small business as a sickle-maker on the spot of the present works. The founder of the business, the late R. Garrett, a most energetic man, commenced business for himself in 1804, and associated his son, the present proprietor, in the year 1826, and died in 1837. The attention of these makers has been principally directed to the invention and improvement of drills, threshing-machines, horse-hoes, chaff-cutting machines, &c. Like their contemporaries, the Messrs. Ransome, they have borne a prominent position at the meetings of the Royal Agricultural Society of England. (See Section IV. for a list of the prizes gained by these gentlemen at those meetings.)

#### *Modern Agriculturists.*

Although, among so many first-rate farmers, it may appear invidious to give the names of a few only, yet *some* remarks seem required in a work of this nature; and the pages of the Royal Agricultural Society's Journal, and their prize sheets, will give us the names of many good Suffolk agriculturists. I would remark of the prizes for stock, that they, as well as those for machinery, show, as much as it is possible to be shown, the superiority, in that particular line, of the gainers of them at the Society's shows over all others in England: and badly situated as Suffolk has been for most of these shows, she has kept equal, and in many things (as horses and machinery) far before other counties which have, from their locality, much greater advantages.



*Articles relating to or written by Persons connected with Suffolk, in the Journal of the Royal Agricultural Society of England.*

MR. HENRY CASE, Thorndon, near Eye: Practical Experience in the Use of Biddle's Scarifier, vol. i. p. 357.

JOSHUA RODWELL, Esq., Alderton: A Report of Practical Operations in the Comparative Use of the Sickle and Scythe in Harvesting Wheats, vol. i. p. 447.

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On the Culture and Usefulness of the Italian Rye-Grass, vol. ii. p. 214.

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On the Italian Rye-Grass, vol. v. p. 284.

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Trial of Nitrate of Soda, vol. ii. p. 260.

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On the Cultivation of Lucerne, vol. iii. p. 238.

(For experiments on the growth of lucerne, made at Livermere, Mr. Rodwell, of that place, was, in 1811, awarded one of their medals by the Board of Agriculture.)

REV. J. S. HENSLOW, M.A., Professor of Botany in the University of Cambridge, and Rector of Hitcham, Suffolk: Report on the Diseases of Wheat, vol. ii. p. 1.

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On the Specific Identity of the Fungi producing Rust and Mildew, vol. ii. p. 220.

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Notice of Contributions of Specimens of Wheat to the Museum of the Society; with Instructions to future Contributors, vol. ii. p. 271.

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Observations on the Wheat-Midge, vol. iii. p. 36.

REV. COPPINGER HILL, Buxhall, near Stowmarket: Suffolk Draining, vol. iv. p. 23.

(This consists of evidence of the cheapness, efficacy, and antiquity of this mode of draining.)

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On the Construction of Cottages (Prize Essay), vol. iv. p. 356.

SIR HENRY E. BUNBURY, Great Barton, near Bury: On the Allotment System, vol. v. p. 391.

MR. GEORGE DOBITO, Kirtling Hall: On Fattening Cattle (Prize Essay), vol. vi. p. 74.

MR. THOMAS COOKE BURROUGHS, Gazely, near Newmarket: On White Mustard (Prize Essay), vol. vii. p. 31.

MR. SAMUEL JONAS, Ickleton, Cambridgeshire—(This gentleman, the author of the Prize Essay on Cambridgeshire, is, as well as Mr. Jonas Webb, of Babraham, the celebrated Cambridgeshire breeder of Southdowns, a native of Suffolk): Suffolk Draining, vol. iv. p. 32.

(A white wheat of this gentleman's raising, "Jonas's Prolific," is mentioned with commendation in the Journal.)

MR. CHARLES POPPY, Witnesham: On Burning Clay, vol. vii. p. 142.

JOHN PEIRSON, Esq., Framlingham: On Burning Land for Manure, vol. viii. p. 77.

MR. JOHN MUSKETT, Fornham, Suffolk: Experiments with Nitrate of Soda on the Duke of Norfolk's Estate in Suffolk, vol. ii. p. 139.

Mr. WILLIAM ADAMS, Great Barton: Improved Dibbling-Wheel, vol. iii. p. 163.

Mr. HUGH RAYNBIRD, Hengrave, near Bury St. Edmunds: On Measure-Work (Prize Essay), vol. vii. p. 119.

On Peat Charcoal, as a Manure for Turnips and other Crops (Prize Essay), vol. vii. p. 539.

On the Farming of Suffolk (Prize Report), vol. viii. p. 261.

Mr. G. E. RAYNBIRD, Hengrave: On the Cultivation of Field Beet (Prize Essay), vol. viii. p. 209.

The following summary will give the names of those Suffolk individuals who were successful competitors at the Cattle-Shows of the Royal Agricultural Meetings:—

*Oxford Meeting, July, 1839.*

To Mr. THOMAS FREEMAN, Henham, near Wangford: the first prize of 20 sovereigns for the best cart stallion.

To Mr. THOMAS CRISP, of Gedgrave Hall, Orford: 30 sovereigns for his 2-year-old Southdown ram.

His Grace the DUKE of NORFOLK: the sum of 3*l.* for his Grace's three 2-shear wethers.

*Cambridge Meeting, July, 1840.*

His Grace the DUKE of NORFOLK, Fornham, near Bury: 15 sovereigns for his 1-year-and-5-months-old Devon bull; bred by himself.

His Grace the DUKE of NORFOLK: the sum of 5*l.* for his Grace's fat Devon heifer; bred by himself.

Lieut.-General Sir E. KERRISON, Oakley Park, near Eye: the premium of 15 sovereigns for his 1-year-and-4-months-old Suffolk bull; bred by Mr. Charles Etheridge, Starston, Norfolk.

Mr. THOMAS N. CATLIN, Chillesford Lodge, Orford: the prize of 15 sovereigns for his cart mare and foal; bred by Mr. Cooper, of Troston, Suffolk.

A horse, 8 years old, bred by Mr. T. O. Taylor, of Flixton, Suffolk, but shown by Mr. John Reynolds, of Wisbeach, gained the prize of 30 sovereigns.

Mr. THOMAS CRISP, Gedgrave Hall, Orford: the premium of 10 sovereigns for his 16-months-old Southdown shearling ram; bred by himself.

Mr. THOMAS CRISP: 30 sovereigns for his 3-year-old Southdown ram; bred by himself.

Mr. HENRY CROSSE, Boyton Hall, Stowmarket: 5*l.* for his Suffolk mare, 5½ years old; bred by Mr. Wilden, of Stowupland.

*Liverpool Meeting, July, 1841.*

Mr. THOMAS CRISP, Gedgrave: the premium of 30 sovereigns for his 6-year-old cart stallion; bred by F. Keer, of Raydon, Suffolk.

Mr. THOMAS CRISP: the premium of 20 sovereigns for his 3-year-old cart stallion; bred by himself.

*Bristol Meeting, July, 1842.*

No Suffolk stock shown.

*Derby Meeting, July, 1843.*

No Suffolk stock shown.

*Southampton Meeting, July, 1844.*

Mr. THOMAS CATLIN, of Butley, near Woodbridge: the prize of 30*l.* for his 4-year-old cart stallion; bred by himself, as executor of the late T. N. Catlin.

*Shrewsbury Meeting, July, 1845.*

Mr. HENRY CROSSE, of Boyton Hall, Stowmarket: the prize of 30*l.* for his 9-year-old cart stallion; bred by the late William Crosse, of Little Finborough.

*Newcastle-upon-Tyne Meeting, July, 1846.*

Mr. NATHANIEL BARTHOFF, of Cretingham Rookery, near Woodbridge: the prize of 40*l.* for his 6-year-old cart stallion; bred by the late H. Bennington, of Framlingham.

At the Northampton meeting, July, 1847, and at the York meeting, July, 1848, no stock was exhibited from Suffolk.

Although no Suffolk breeders showed anything either at Northampton or York, yet the Suffolk horses, shown by persons not connected with the county, kept their old pre-eminence at both shows. Thus, at Northampton:—

His Grace the DUKE of MANCHESTER, of Kimbolton Castle, Hunts: the prize of 15 sovereigns for his 6-year-old cart stallion, of the Suffolk breed; bred by Mr. Thomas Catlin, of Butley Abbey, near Woodbridge.

VISCOUNT HILL, of Hawkstone, near Shrewsbury: the prize of 15 sovereigns for his 2-year-old cart stallion, of the Suffolk breed; bred by himself.

At York was the finest show of horses ever seen, there being not less than 120 entered for competition, and 33 in the class for agricultural purposes. The first prize in this class was 30*l.* to the Most Honourable the Marquis of Downshire, for his 5-year-old Suffolk cart stallion; bred by Sir Francis Lawley, Bart., of Middleton Hall, Fazely. The second prize of 15*l.* to Mr. John Wood, of East Mersea, Colchester, Essex, for a 7-year-old Suffolk cart stallion; bred by Mr. Samuel Winch, of Great Holland, Essex.

The Suffolk stock may continue to win, but year by year the Suffolk horse-breeders will be less and less likely to win prizes. The stock being so noted, the best horses are purchased by gentlemen; and Suffolk farmers cannot contend against the land-owning agriculturists of other counties.

IV.—*A Description of the Agricultural Machines invented or manufactured in the County.*

“EXTRAORDINARY improvements have been made in the agricultural implements of Suffolk during the last forty years. The annual meetings of the Royal Agricultural Society in various parts of England have induced our larger manufacturers of agricultural implements at Ipswich and Leiston to exhibit specimens of all those most generally used at the present time. The two-horse iron foot-plough, the drills for every kind of corn and seed, the horse-hoes, rolls, harrows, scarifiers, and threshing-machines, which a few years ago obtained the name of Suffolk Plough, Suffolk Drill, &c., may now with almost equal propriety be called after the name of that county in England in which they may be used or manufactured. A Suffolk agricultural labourer who has been accustomed for many years past to take a drill with him to the West of England for the purpose of putting in wheat, was asked, on his return a short time since, of his success. The man replied, ‘I never saw anything like it; the farmers in the shires have all got drills now, and their men can work them as well as I can myself. It is very little profit to go; times are very much changed; formerly great numbers of men like myself paid our rents by what we could earn drilling in those parts.’”

Although, as my esteemed correspondent has truly observed, the Suffolk implements are now quite as much English as Suffolk, still an account of them could not with propriety be left out of a Suffolk Report, of which they form perhaps the most important feature. I shall therefore first give a succinct account of Suffolk inventions, followed by a description of all the agricultural machines, with wood-cuts. For the latter I am indebted to the kindness and liberality of Messrs. Ransome, Garrett, and Hurwood, and for the description principally to Allan Ransome’s work, ‘The Implements of Agriculture.’ I shall conclude with a list of the numerous prizes gained by Suffolk mechanists at the meetings of the Royal Agricultural Society.

The modern improvements in agricultural machinery may be said to consist of the following points:—1. The substitution of steam or horse power for manual. 2. A reduction of the horse or hand power required to work the various machines. 3. The substitution of wrought or cast iron for wood. 4. The introduction of the lever principle. 5. Making a machine serve different purposes at the same time. 6. Making it to serve different purposes at different times. 7. Making it portable and hiring it out as a matter of business.

I shall proceed to show what has been done by Suffolk me-

chanists under these separate heads, and here I remark that I shall only take particular notice of those machines which are *not* mentioned in the next portion, referring the reader to many implements there described at length, which no doubt might be placed under some of these heads:—

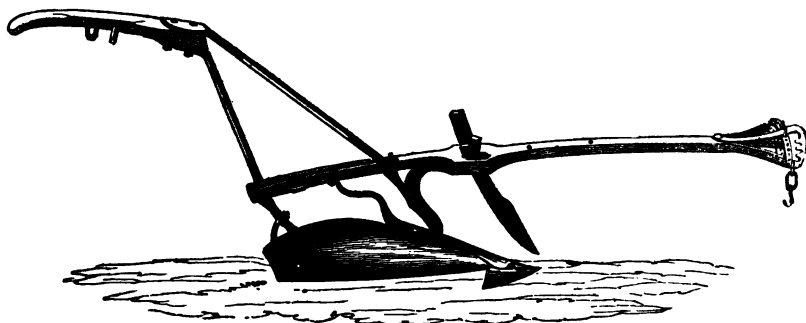
1. *The Substitution of Steam or Horse Power for Manual.*—Almost the only machine to which I can trace a Suffolk origin under this head is the draining-plough of Makyns, invented about 1770, and alluded to in various parts of this Report. I consider this the first plough for *cutting* drains (the mole-plough was probably the first drain-plough), from Mr. Morton's saying in his 'Essay on Agricultural Mechanics,' vol. iii. p. 102, Journal of the Royal Agricultural Society, that "the first description he has seen of such an implement, which appears however only to have been applied to cutting grips or surface-ditches, is in Mr. Douglas's Report of Roxburgh and Selkirk, 1813, in which he speaks of a kind of instrument or plough which cuts and removes a square foot of earth, and with six horses and five men will drain a greater extent in a day than 100 men." The turnip-cart and cutter may be considered as an example of both this and the fifth point.

2. *A Reduction of Horse or Hand Power required in doing a stated Quantity of Work.*—This is the main object of all mechanical improvements, and therefore need not be much alluded to. I cannot help referring to Ransome's ploughs as having opened quite a new era in this respect, by which two-horse ploughs were rendered suitable for almost every description of land, and one-horse ploughs were brought into use on very light soils. The light and simple plough-harness of Norfolk and Suffolk is now, like the ploughs, common everywhere; but it appears not very long ago to have been peculiar to these counties, and copied from thence into Scotland. See a former page of this Report.

The "reduction of horse power" is said to be much wanted in our waggons and tumbrils, but I think their clumsiness is rather in look than in reality, and arises from village wheelwrights being employed instead of large manufacturers. Both tumbrils and waggons are generally used in farm-work with two horses at length, and as the leader is taken off when the vehicle stops at the place of loading and unloading, there are *not two* horses employed to each carriage used. I have seen in a hard frost corn got in with these waggons with one horse, which shows they are not very cumbersome, and I have also seen two horses obliged to be used in the modern harvest-carts with heavy loads. It is the occasional sight of corn carried out with a long team of four horses at length, which made them to be thought so very heavy; but teams of three, two shaft-horses abreast with a leader (unicorn team), or

one shaft-horse and two leaders abreast, or even of two abreast only, are quite as common. From the prevalence of "two-horse farms" a two-horse system has sprung up, i. e. two horses to a plough, drill, light scarifier, harrows, heavy roller, tumbril, and waggon.

3. *The Substitution of Wrought or Cast Iron for Wood.*—In my short account of "Brand," a blacksmith formerly living near Ipswich, I have shown that he was the maker of the first wrought-iron plough. Arthur Young, in his 'Eastern Tour,' drawn up in 1770, mentions that this plough was in high repute at that time; and in the Berkshire Report it is mentioned that the Suffolk plough was then used on King George III.'s farm at Windsor. The first iron plough made in Scotland was shown at the last Highland Society's Show, and is "upwards of fifty years old, and was made by William Allen, Bankslop, Rothwell, Lanarkshire." Brand's is upwards of seventy-eight years old.



Brand's Plough.

It will be seen that this plough has but one handle; such are common in Suffolk and Norfolk, and appear to have been derived originally from Holland. The plough-staff serves as a loose handle, and also to clean the mould-board. Sinclair, in his 'Code,' observes, "To oblige the ploughman to walk upright and to carry his own weight, the Norfolk and Suffolk ploughs have but one handle, which soon tires the hand of the man who presses upon it."

The introduction of cast-iron into machines was of later date, and required greater skill. All the essential parts of the plough are now made of cast-iron, and all (with the exception of the mould-board, which Small invented) owe their introduction to Messrs. Ransome.

The first harrows and scarifiers wholly of wrought-iron that I have heard of were made in Suffolk, and were in extensive use, as

a local Magazine (the 'East Anglian' of that date) informs me; in 1814. The first cast-iron scarifier was, if I mistake not, Biddell's.

4. *The Introduction of the Lever Principle.*—To give a constant and equable pressure which may be increased or lessened at pleasure appears to owe its origin to Baldwin, a farmer of Mendham, in Suffolk, who in 1790 first added it to drills to give each separate coulter an independent motion and what pressure it required. It was soon after introduced into the East Lothian stubble-rake, and fifty years afterwards another Suffolk man (Garrett) added it to horse-hoes. Who first added levers to scarifiers (as Biddell's, for instance) and other tillage implements for altering and regulating the depth in the soil, or wholly putting out of work, without stopping the horses, I know not, but Henry Osborne, a Suffolk farmer, first added it to the wheel of a plough.

5. *Making a Machine serve different Purposes at the same Time, so as to complete the proposed Work at one Operation.*—As examples we have drills which drill in the manure and cover it, drill the turnips and cover them, and shape the ridges at one operation, and drills for manure, corn, and seeds at the same time. Which county has the merit of introducing these combinations I know not, but Suffolk is as probable a one as any, from the long standing of its drill-manufacturers.

6. *Making Machines serve different Purposes at different Times.*—This is especially useful for machines for which there is only an occasional use, but care must be taken that one operation does not spoil the other, and we have an indifferent "Jack of all trades" in the machine line. As examples of this principle Clarke's Universal Plough, which can be made (1) a double tom or ridge-plough, (2) a moulding-plough, (3) a horse-hoe or cleaning-plough, (4) a skeleton or broad-share plough, altogether a very perfect tool for ridge culture.

Cooke's drill (the original of the Suffolk one) was, though now superseded, a most complete implement for light dry soils and flat culture. It was invented about 1780. The same machine was easily transformed into a cultivator, horse-hoe, scarifier, or grubber; and by substituting a corn-rake, stubble-rake, or quitch-rake for the beam of coulters or hoes, it would rake corn-stubbles or clean land of root-weeds. I believe some of Garrett's drills are so made that by removing the drill-box, and substituting tines and hoes for the coulters, they serve for lever horse-rakes and horse-hoes.

7. *Portable Machines.—Hiring ditto out.*—I have, in a notice of Asbey, of Blyborough, remarked that the first portable threshing-machine was of Suffolk invention. The custom of hiring out threshing-machines and drills as a matter of business appears to

have been so likewise. Our custom of letting out machines is thus mentioned by Loudon, 'Encyclopædia,' 1832; but is of much older date: "Portable threshing-machines are very common in Suffolk. It is not unusual in that county for an industrious labourer who may have saved 30*l.* or 40*l.* to own one, which is moved from place to place on two wheels, and worked when fixed by three or four horses. The horses and other labourers are supplied by the farmer, and the owner of the machine acts as feeder. The quantity threshed is from 15 to 20 quarters a-day." The earliest notice I have seen of the letting out drills is in the 'Suffolk Report,' 1804, p. 351: "Labourers buy drill-machines (Cooke's), with which they go out drilling at 2*s.* an acre, and some of them earn from 10*l.* to 20*l.* a-year, and some more, by this practice." Mr. Cooke was apparently the mechanist of Halesworth whom I mentioned in a former page. The custom of the Suffolk drill-men travelling with their machines to distant counties, as Oxfordshire, Wiltshire, &c., is, as I have shown, on the decrease. The letting out of machines as a separate business is peculiarly suitable to counties where small farms are numerous and the implements only of occasional use. The system might be extended to many other machines, as haymakers, machines for mowing hay and cutting corn (such machines are used in America), draining-ploughs, subsoilers, clod-crushers, and what would be very useful in many counties, two-horse ploughs, to introduce straight ploughing and give a lesson to master and men.

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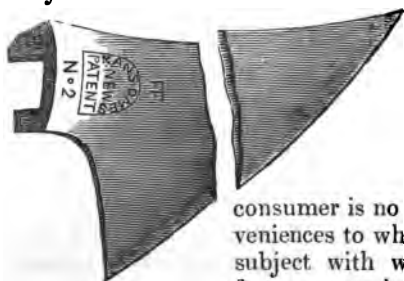
1. *Ploughs*.—The Messrs. Ransome, of Ipswich, have for a long series of years made the plough a special object of their study, and that they have succeeded may be inferred from the general use which their ploughs have obtained. There is scarcely an agricultural meeting of any note in England at which trials at ploughing-matches have not been made to bring these ploughs in competition with those of local and other makers, and the results are too well known to need repetition here. In the construction of the plough they have availed themselves of such form and material as combine lightness with adequate strength, and have contrived to fit the several parts in so simple a manner that all may be easily removed and replaced as occasion requires by a ploughman without leaving the field. The strength of the various parts of the plough is so arranged and proportioned as that while as a whole it is sufficient for ordinary work, if an impediment in the land either in roots, stones, &c. occur, that part is the first to give way which is the least expensive and most easy to repair. The iron-work can also be obtained separate, so that local plough-makers can fit them up with beams and handles of wood; and every part of the iron-work is so made to pattern and system



that there is a certainty of each fitting properly without requiring any further mechanical skill than ploughmen in general possess. In short, it may be truly said that Ransome's plough-manufactory is not only the most extensive in England, but in the world, and the ploughs are very extensively exported to the colonies, for which the properties I have referred to render them peculiarly suitable.

Ploughshares were made of *wrought*-iron until, in 1785, the late Robert Ransome, of Ipswich, first obtained a patent for making "shares of cast-iron;" and this circumstance is worthy of notice, not only as a very important and successful improvement in the part in question, but as the means of drawing the attention of that individual and many others to further improvements in the plough, which were very soon after carried into effect. In 1803 Robert Ransome obtained a second patent for a mode of applying a case-hardening process to cast-iron shares. This invention is now so well known that a brief description of it may suffice.

Before the time referred to, cast-iron shares, although occasionally used in some districts, were found to wear away too fast from the under side. When the first edge was worn off the share became too thick to cut the ground properly, and its tendency when so worn was to "lose its hold of the work," and to pass over weeds without cutting them, while the blunt edge greatly added to the draught. The improvement alluded to is that of case-hardening the under side the thickness of one sixteenth or one-eighth of an inch, which is in effect like a layer of steel underneath the share. This part, from its hardness, wears very slowly, while the upper part of the share grinds more quickly away, thereby producing a constant sharp edge on the under side. The land-side point of the share is also hardened in a similar manner, which prevents it from wearing so fast as it would otherwise do at that part, a tendency to which all shares are more or less subject. The following figure shows a broken share, in which the white lines indicate the hardened parts.



By the use of cast-iron shares thus tempered considerable expense is saved, the first cost being so much less than wrought-iron that they may be renewed at smaller charge than the repairs needful to the latter. Another benefit arises from their use, that the

consumer is no longer liable to those inconveniences to which he was before necessarily subject with wrought-iron shares, from the frequent repairs requisite in sharpening and

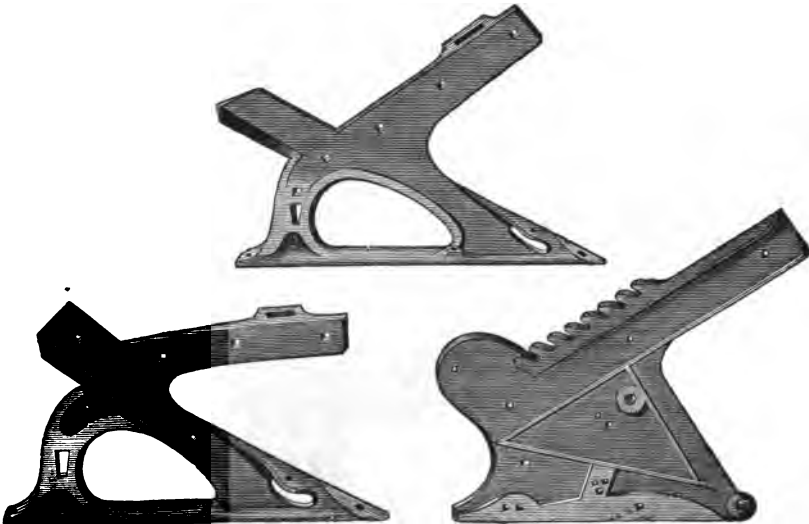
"laying" them, an operation requiring the aid of a blacksmith, who generally working at a distance from the farm, very often unprofitably occupied the time of the men and horses.

Following up this improvement in the shares a Suffolk farmer invented for his own use a cast-iron plough-ground or bottom, with a moveable sole or slade; this had mortices to receive the tenons of the wood, to which it was attached. This plough-ground soon became of general use in the counties of Norfolk, Suffolk, and Essex, and but few ploughs were then made without it.



Plough-ground and Share.

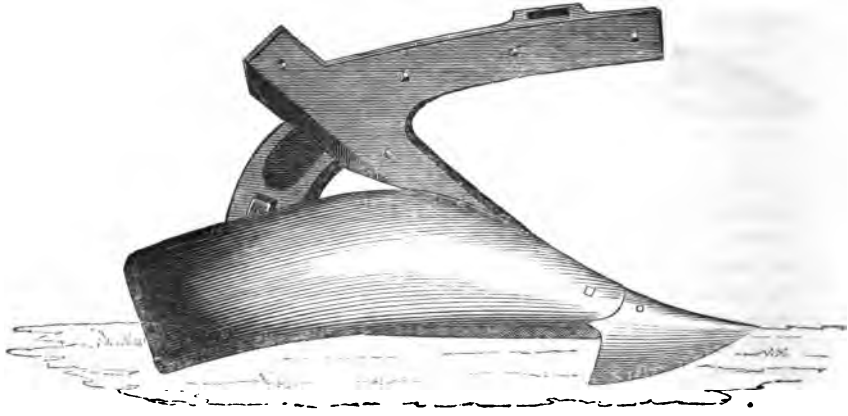
There was still a defect to which even ploughs made with this iron ground were liable, which was that nearly the same uncertainty attended their manufacture as in those constructed entirely of wood; scarcely two workmen would make them alike, and sometimes one plough would work well and easy to the holder, while another made by the same hand would be inferior in these respects; in addition to which inconvenience the wood tenons in the iron mortices were liable to decay, and a constant expense of repair was entailed, which has of late years, under further improvements in the construction of ploughs, been obviated. Soon after the introduction of the cast-iron share, ploughs were invented having their entire bodies made of cast-iron.



Plough Frames.

The frames, of which the preceding are sketches, were so contrived as to admit of the handles, beams, shares, mould-boards, soles, and other parts being screwed to them, and any portion altered or removed at pleasure. They also admitted of the mould-board being set to a wider or narrower furrow, and of changing the shape of different parts as they were required for different purposes.

The following figure shows the entire body of the plough.



Plough Body.

As every part of the plough upon this construction admits of being easily replaced by the ploughman without the aid of a mechanic, the farmer has only to keep by him a stock of the wearing parts to ensure his plough being at all times in working order and in the original form.

This arrangement of the body of the plough was a very considerable improvement beyond anything that had been before produced, and is applicable to ploughs of almost every description, as is shown by almost every one of the ploughs exhibited at the Royal Agricultural Society's annual meetings being so constructed.

The plough-head, which requires no description, I notice because



English Plough-Head.

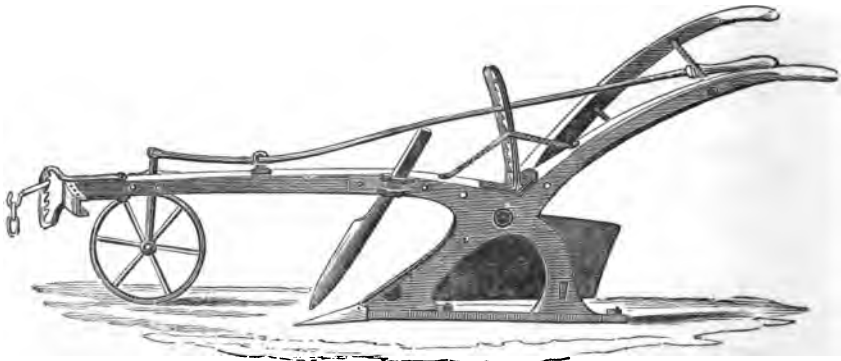
### Wheel Plough, with High Gallows.

I shall now proceed to give some examples of ploughs, patent or otherwise; and first, the wheel-plough with high gallows, usually called the Norfolk wheel-plough, and used in many parts of Norfolk, Suffolk, and Essex. The dotted lines upon the

figure, from the frame at *d* to the point *c*, will give the figure of the swing-plough; and what is intended by this is to show that the line of draught will be the same in either case, and that the line *a b* should be intersected by the draught-iron of the plough. The beam of the wheel-plough is elevated and made to rest on a bar of wood called the bolster, crossing the upright standards *e* and *f*, and the latter form part of the carriage framing supported by the wheels; the draught-chain *g* collars the beam at *h*, and will remove at pleasure from the notches at *h* to the one at *i*; the small chain *k* serves to keep the standards in their upright position; *l*, the bolster, is made to rise and fall, as the plough may be required to cut shallower or deeper. The plough is made to go more "to or from land" by altering the chain to a notch in the hake at *g* either to the left or the right hand, or the same at the hake *m*. The former acts instantly on the body of the plough, the latter on the carriage and wheels. Corresponding alterations with the latter must be made by the pins in the bolster.

All wheel-ploughs, whether with high gallows, furrow-wheel, or wheel and furrow-wheel, require frequent adjustment as to their wheels, which occasions loss of time, and unless the furrows be ploughed beyond the length required, the large wheel must be raised at each end of the field just before the plough comes out of the furrow, or it will be taken gradually out of the ground, and the land will not be ploughed to its full depth.

The loss of time involved by alteration of the furrow-wheel may be overcome by a simple mechanical contrivance: with a lever, the longer end of which reaches the handle of the plough, and by it the wheel can be adjusted to any depth instantly. The invention of the late Henry Osborne, a Suffolk farmer, effects this purpose and answers admirably.

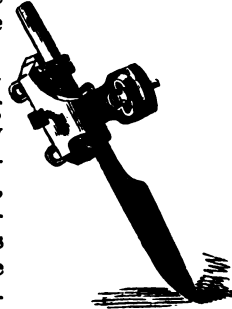


Lever Plough.



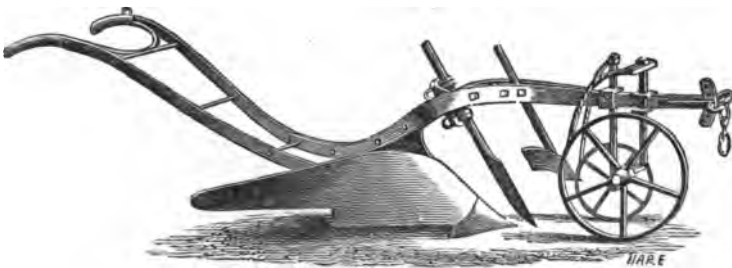
Ransome's Rutland Plough, with Iron Truss-Beam.

This plough obtained the prize both on light and heavy soils at Southampton, and may be used either as a wheel or swing plough. For general purposes it may be considered as worthy of a preference over most, if not all, others, and by changing the mould-board only, which was the case at the trial at Southampton in 1844, it will answer equally well for heavy as for light land. This plough in its original form (with wood beam and handles) was first introduced into Rutland by Richard Westbrook Baker, Esq., and obtained general use there; and subsequently from various trials and experiments it was brought to its present form, and is now known as the Improved Rutland Plough marked Y. L. The coulter-fastening is on a new principle, affording facilities for quickly placing the coulter in any required position. By loosening the loop-bolt in front, the coulter-fastening, which hangs upon a pivot-bolt, may be altered and set to any angle of inclination, and by loosening the looped bolts behind the coulter it may be turned to the right hand or left, and afterwards by screwing up the bolts set fast. It is adapted for all the patent iron ploughs.



Ransome's improved Coulter and Fastening.

The following cut represents a plough which has recently been



The Kent Plough.

made for supplying the wants of those who prefer a light two-horse plough to the four-horse turn-rest plough, in general use throughout Kent and the neighbouring counties. It is used with a pair of horses. It gives the same turn of furrow as the turn-rest, and lays the land upside down, but the mould-board does not change from side to side. The seam so much admired in Kentish ploughing is left perfect by this plough. It is marked Y. S.

*Ransome's Patent Trussed Whipple-trees.*

The annexed cut will convey an idea of the construction of these whipple-trees, which are made on the *truss* principle of light wrought-iron. By this arrangement great strength is obtained, and many delays and accidents which attend the use of the common wooden articles are avoided.



The following description of Ransome's patent ploughs, made entirely of iron, is extracted from the Journal of the Royal Agricultural Society of England:—

(*Derby Meeting*, vol. iv. p. 467.) “They would particularise as worthy of high commendation those produced from the manufactory of Messrs. Ransome, composed entirely of iron and steel. The beams of these ploughs are constructed on the truss principle, which, though novel in its application to the plough, has long been appreciated by mechanics as possessing the greatest stiffness combined with lightness. It is this consideration which has induced those makers to abandon the use of wood, hitherto used by them for this part of the plough in preference to a beam of solid metal. The structure of their improved iron beam is such as to destroy lateral vibration, particularly at its root or juncture with the body of the plough. It admits also of a neat and powerful fixing, as well as ready adjustment of the coulter.

“Tremor in mechanism is well known to consume power uselessly, and in the case of the plough vibration in the beam, though it be insensible to the eye, renders the guidance of the implement more difficult and its work less exact. The circumstance of increased stiffness attending mere weight of matter may have been one cause why the heavier ploughs have not unfrequently been found to require less force of draught than lighter ones for an equal weight of soil moved; but stiffness is not incompatible with lightness, and a diminution in the weight of an implement, when perfect action is otherwise secured, must be attended with economy of power, or, what is the same thing, with a diminution of resistance, whence truer work results.

“It is also important that the handles or stilt should be stiff enough to transfer the effort of a holder to the body of a plough with the least expenditure of his strength; for the easier its guidance the greater will be the certainty of the labourer's attention to his business. This pro-

perty has also received the care of Messrs. Ransome, and together with the simple means applied for adjusting and replacing the mould-boards, shares, and wearing parts of the various ploughs exhibited by them, testified to the thought and ability bestowed on the most minute details of an implement which still maintains its claim to be the most indispensable, as it was probably the earliest-invented auxiliary to human labour in tilling the soil."

(Vol. v. p. 367.) "*Ploughs.*—The judges having selected, from the immense number of ploughs exhibited, such of them as they deemed particularly worthy of trial; these were apportioned to the light or stiff land farms, according to the wishes of the exhibitors. At the time of trial each plough had a separate land assigned to it, and each ploughman was desired to execute the best work he could, without regard to quantity, the excellence of the performance being the object principally sought. Some of these ploughs were entered as wheel-ploughs only; some were represented to work with two wheels, or with one wheel, or as swings; others were constructed purely on the swing principle. Under these circumstances the judges thought fit first to order the two-wheel ploughs into action; then those with one wheel; and then the swing, or the ploughs without a wheel. By this arrangement not only was the quality done by each implement displayed, but a fair opportunity offered itself for observing and comparing the quality of the work as executed in the same soil, and under the same circumstances, by the three classes of the implement. The skill of the individual construction was also manifested; and on this occasion the remarkable result came out that one particular plough excelled all the others, whether working with two wheels, with one wheel, or without a wheel. In such a case the work done by this plough was unquestionably superior to that effected by any other competing with it; and it was equally unquestionable that the order of excellence, in respect of work, was—first, that executed by this plough when fitted with two wheels; secondly, with one wheel; thirdly, when acting without a wheel, or as a swing. This plough was one of three in the field from the manufactory of Messrs. Ransome, marked Y. L.; and to them the judges awarded the Society's prize of ten pounds and the silver medal.

"These remarks have reference to the trials made on the light land at Mr. Gater's farm; and precisely similar results were recognised by the trials which took place on the very hard stiff soil at Mr. Spooner's farm. Here, again, the superiority of the same plough developed itself, but to meet the condition of the soil Messrs. Ransome had fitted it with a longer and differently-curved mould-board. To them the judges also awarded the Society's prize 'for the plough best adapted to heavy land,' as well as for 'light land.'

"Some very good work was done on the light soil by ploughs manufactured by Mr. John Howard, of Bedford, and by Messrs. Sanders, Williams, and Taylor, of Bedford. On the stiff soil the judges commended the performance of a plough by Messrs. J. and E. Plenty, of Newbury, an old Hampshire implement, as being apparently of light draught; also a plough by Mr. Howard, of Bedford, both working with two wheels. The performance of the swing ploughs was very indifferent



on both sorts of soils, excepting that of Messrs. Ransome's implement on the lighter soil.

"In recording these trials the writer, who had the advantage of attending the two judges of this department, and of communicating with them during all the trials, only repeats their sentiments in marking the difference of the work under the three varied applications of Messrs. Ransome's plough. When fitted with two wheels its performance was like that of a planing-machine; the furrow-slices were cut vertically from the land, the floors or bottoms were left perfectly flat and clean, and the slices were deposited at an angle of about 45 degrees with such truth that they could be turned back to their original horizontal bed without gaining or losing ground. According to the generally received principles of perfect ploughing (whether they be correct and equally suitable to all soils and modes of culture or not), it is imagined that practice has in this instance closely approached to their fulfilment.

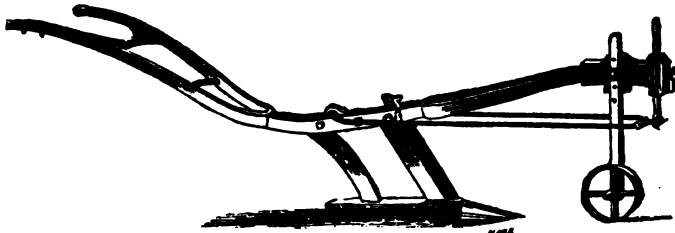
"When fitted with one wheel, though the work of the plough was excellent, yet there was an evident declining from that extreme regularity and finish belonging to the first performance. When acting without a wheel, or as a swing, an effect was plainly discernible, and which is directly traceable to the influence exercised over the motion of the plough by the motion of the draught animals. The floor of the furrows, though cut nearly as flat as in its transverse section, as in the two former cases, no longer presented so continuously even a surface as if fashioned by a tool travelling along and maintaining an unvarying plane; it was wavy, exhibiting short, burst, or broken surfaces, and answering to the impulses of the animals. Nor was this owing to want of skill in the ploughman, as compared with the skill of others who brought their best swing-plough and their best ploughman to compete for the prize, for the furrow bottoms of the latter were still more jagged and irregular. Had the light soil operated upon been in a condition fit for autumnal ploughing, there can be but little doubt that all the swing-ploughs would have acted better, and that less difference would probably have been perceptible in the quality of the work; yet the writer esteems it to have been advantageous to the progress of arable mechanism that these trials occurred at a period when the merits or defects of the ploughs were prominently brought out by the excessively baked state of the soil. On the hard land especially (at Mr. Spooner's) 'proof of bottom' was obtained. Several of the ploughs would not enter the ground, nor work to the depth required; others were continually thrown up on the surface, and some were quickly crippled in some way or other. The test was certainly severe, but the merit of any plough was proportionably great, which could perform good work under such circumstances.

"The inquiries addressed to the judges and to the writer have been numerous and very natural, as to how it happened that the same plough proved to be equally fit for light and heavy land? The explanation has already been given by the statement of the fact that Messrs. Ransome changed the mould-board from one adapted to light land to one suited to heavy land, an alteration effected in less than five minutes; and abundant proof was afforded to, and acknowledged by, the judges, that one given form of mould-board is utterly inadequate to suit both soils.

"Much, also, of the success of this plough is due to the principles of its construction, as already explained in the Report of the Derby Meeting."

*Subsoilers, &c.*

*Rackheath Subsoil Plough.*—This plough is the invention of Sir Edward Stracey, Bart., and is called the Rackheath, that being his residence. It performs the operation of subsoil ploughing to the depth of from 15 to 18 inches below the surface, and when preceded by the common plough, which is the plan recommended, the depth reached below the surface-ground is just so much the more than the first plough effects.



Rackheath Subsoil Plough.

*The Rackheath Subturf Plough* (see fig.) is also the invention of Sir Edward Stracey. It answers admirably for under-ploughing grass lands, and only differs from the subsoil plough in having a carriage and two wheels in front, instead of a single wheel. Both these ploughs are manufactured by the Messrs. Ransome.

*Mr. Paul's Draining-machine and revolving Subsoiler.*—I extract the following from the 'Norwich Mercury':—

"We have before mentioned these two inventions, and it gives us great pleasure to know that their value was fully appreciated at York, where Mr. Paul exhibited the models. The stand on which they were shown was one continued scene of bustle. They were visited by all the first-rate mechanists, and such was the high opinion formed of them, that, in speaking of the subsoiler, a gentleman of experience declared, 'it would double the value of nine-tenths of the land in England, and when coupled with the drainer would work a complete revolution.' Mr. Paul had the honour of an interesting interview with his Royal Highness Prince Albert, to explain the operation of the machines."

The 'Mark-Lane Express' says:—

"Of all the implements exhibited at the great York meeting there was probably none that excited more attention than the patent deep-draining and subsoil-raising machine, the invention of Mr. Paul, of Thorpe Abbots, Norfolk, of which a model only was shown, but which, we understand, is in actual operation on Mr. Paul's farm in Norfolk.

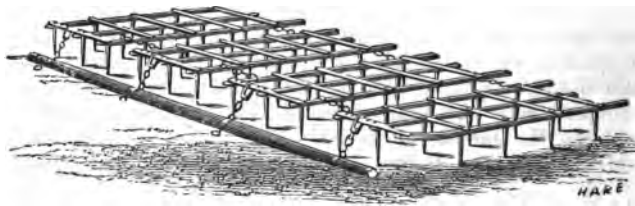
He has proved that with the power of three or more horses a drain may be cut, so as to leave the sides and bottom quite clean, to a depth varying from 3 to 5 feet. The soil taken out during the operation is brought to the top, thrown aside, and may be equally spread over the surface, if necessary. To the scientific observer it was obvious, and indeed it was remarked by one of our most intelligent agriculturists, that it was calculated to effect a complete revolution in heavy-land farming, particularly when used in connexion with another machine invented by the same gentleman, and applied to the purpose of deep subsoiling and pulverizing the land. Never, perhaps, was so small an amount of horse-power found capable of producing such extraordinary results."

In the agricultural department of the 'Gardener's Chronicle,' in alluding to the draining implements, the editor says:—

"Under this head we must not omit to mention a model of a very powerful machine invented and manufactured by Mr. Joseph Paul, of Thorpe Abbots Hall, Norfolk. We had previously heard something of the working of this machine, and have no doubt, from the ingenuity and respectability of Mr. Paul as a large practical farmer, that his description of its capabilities and powers is fully borne out by facts. Mr. Paul has applied the same principle to a separate machine for deep subsoiling and pulverizing the land to the depth of 20 and 30 inches, and at the same time bringing up such portion of the subsoil to be distributed on the surface as may be deemed expedient.

"*Subsoil Ploughs and Pulverizers.*—Of these there were upwards of 20 varieties, more or less effective in their operation, but that of Mr. Paul, on the principle of his patent deep-draining machine, will eventually surpass all others in its permanent operation and effect on the soil. We congratulate our friend on his deserved success, which we understand will be even more firmly secured in a few weeks by a perfect machine being brought into work. Mr. Paul's stand may have been crowded at York, but we think, when in operation, his farm will be the constant resort of all who wish to make England grow enough for her population."

Although both the Rackheath and Mr. Paul's invention are of Norfolk origin, yet they appear, especially the latter, of too much importance to be left unnoticed.

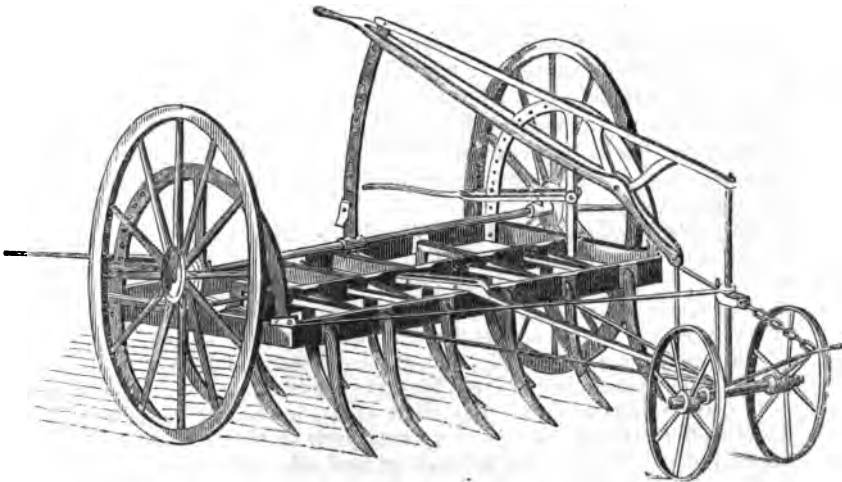


HARROWS.

The above cut represents a set of iron Seed-Harrows in general use throughout the county of Suffolk. They are used in gangs of three, four, or five, as may be required to suit the lands on which they are used, and may be made to any weight required.

*Biddell's Extirpating Harrow, made by Ransome.*—This implement, invented by Arthur Biddell, of Playford, is similar to the scarifier which bears his name. It is intended for breaking up land when it is too hard for the heaviest harrows, and for bringing winter fallows into a state of fine tillage. In working summer-lands it is calculated, by the shape of its teeth, to bring to the surface all grass and rubbish. The teeth are placed in three rows, in order to allow sufficient distance from each other to prevent choking, and the implement is so constructed, that, by means of levers, the teeth may be elevated or depressed at pleasure. According to the form of the lands it may be required to operate upon it, it may either be used perfectly parallel or the fore-teeth may be made to penetrate deeper than the hinder ones, whilst those at either side may, when one wheel is required to run in the furrow, be instantly adjusted to the level of the land, so that every tine shall penetrate to a uniform depth of six inches if required, and they will work equally well at any less depth.

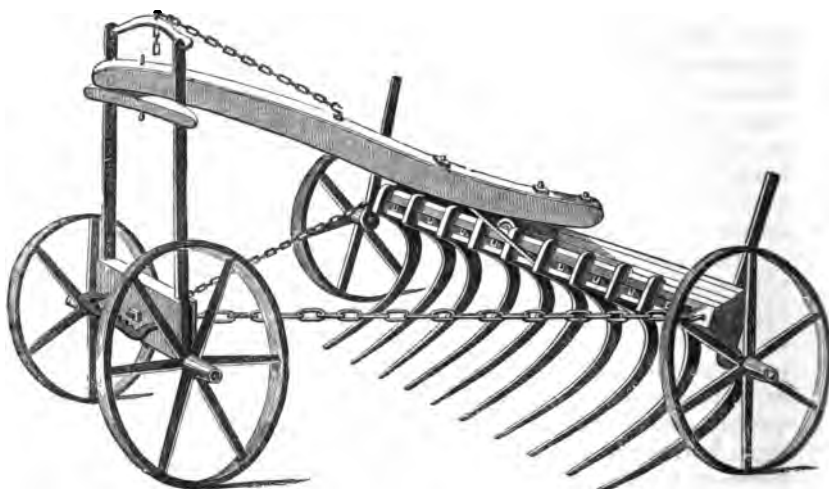
This implement may be used on very foul land, and on stubbles when too hard to allow the use of the plough. As the interval between the lines formed by its teeth does not exceed four inches, the soil is completely stirred. The tines may be either used with points or with steel hoes, and with the latter, the skimming, or as it is frequently called the "broad-share" process, may be quickly accomplished. The weight is not found to be a disadvantage, but, from the stability it gives, the contrary; and being borne on high wheels, it does not require so much horse labour as



Biddell's Extirpating Harrow.

might be supposed, two horses on most soils being generally sufficient.

*Scarifiers.*—Fuller's extirpator, invented about thirty years ago by Robert Fuller, a practical farmer of Rushmere, near Ipswich, came into operation and worked exceedingly well. Its character will be seen from the following cut: the tines are suspended upon a round axle, and may be turned up out of work, at pleasure, when fewer required, or at wider intervals.

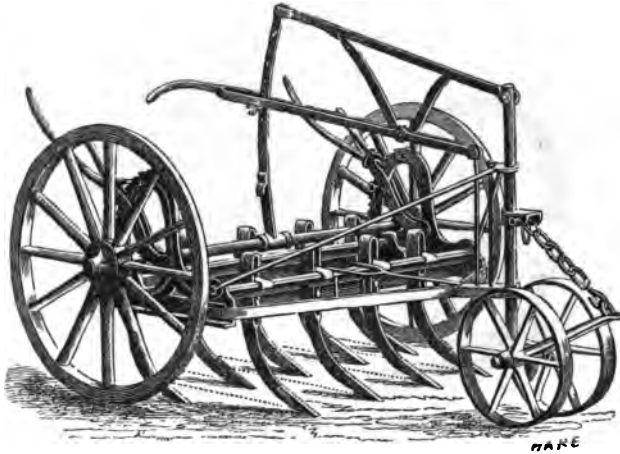


Fuller's Extirpator.

*Fuller's Extirpator.*—This implement is still in use in the county of Suffolk, but it is now generally constructed with two beams and a double row of tines; by this alteration double the space is allowed between each tine, the implement is less liable to choke, and works more freely through the soil. The carriage upon which the beam rests is similar to the common wheel-plough carriage or gallows.

*Biddell's patent wrought-iron Scarifier.*—This implement is the invention of Arthur Biddell, of Playford, and was first made under his direction about thirty years ago, with the framing of wood, and tines of wrought-iron. It is used for the purpose of cultivating land under a variety of circumstances, and bringing it into a proper state of tilth, much more effectually, and at less expense, than can be done by the means generally employed for that purpose.

It may be successfully used to clean wheat, bean, and pea stubbles directly after harvest. To break up such parts of clover layers as may have failed in the plant, and to break up land after green crops in May or June, in preparation for turnips, coleworts, &c.; thus accomplishing



Biddell's Patent Wrought-Iron Scarifier.

fine and deep tillage, without bringing fresh earth to the surface-land, in preparation for barley and oats. The improvements upon the cast-iron Scarifier consist in making the frame partly of wrought-iron, and with two lifting levers and catches, so that one side may be raised higher than the other, to suit sloping ground, or to allow one wheel to run in a furrow whilst the teeth penetrate the cultivated ground to a uniform depth. The teeth are also of wrought-iron, and are secured to the frame in such a manner as to allow of varying both their distances from each other, and the depth to which they are to penetrate, allowing also of setting them to suit rounding lands. There are two sizes made, viz. No. 1, with 9 teeth, and No. 2, with 7 teeth.

The advantages resulting from the use of Biddell's Scarifier are as follow :—

*A saving in Tillage* of half the labour, both manual and horse, over the ordinary method of cleaning land.

*Saving of Time.*—Lands may be broken and stirred with this implement in much less time than with the plough.

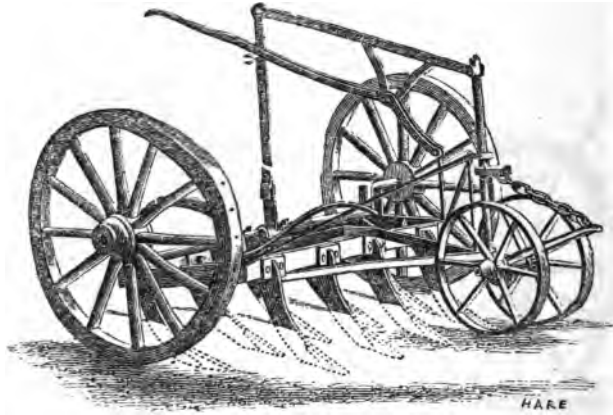
*Improved Cultivation.*—The operation of this Scarifier is much more effective for spring crops on strong lands than ploughing, as it occasions less treading by horses, produces more mould, and allows the moisture to be more advantageously retained, and the seed will be deposited in the soil which has been exposed to the winter frosts.

*Less Harrowing is required,* as the land is broken up and left much finer than after the plough.

*The Couch-Grass (if any)* is brought to the surface without breaking it.

The land is left by this implement in a state to be immediately harrowed, which may be done in time to break the clods before they become too hard.

In all cases where it is desirable to give tillage to the land without turning down the surface, this implement may be used with great advantage.

**Biddell's Cast-Iron Scarifier.**

*Biddell's cast-iron Scarifier* consists of a very strong cast-iron frame, upon which the teeth, nine in number, are arranged in two rows, and so disposed at intervals of sixteen and a half inches from each other, as that those in the hinder row should form a path midway, in the intervals left by the passage of those in the front. It is suspended on a cranked axle, between two wheels fifty inches in height behind, and on an upright shaft, carried on two small wheels running close together in front. It will be seen that the machine is thus suspended on three points, and by the means of two levers, the one to direct the position of the front teeth, and the other to regulate the depth of the hinder ones, it may be balanced between these points in any direction that may be required.

It may thus be used, either with the four tines parallel with the hinder ones, or at a greater or less depression; this arrangement allows it to penetrate very strong on hard land, and to retain its hold when scarcely any other implement would produce any effect, and even the plough could not work to advantage. By a simple contrivance to shift the bearing of the frame upon the axle, either side of the machine may be depressed so that the tines shall penetrate the land to a uniform depth, even when, from the circumstance of one wheel having its path along the furrow, the bottom of the wheels may not be parallel with the general level of the land. The tines are prepared to fit case-hardened cast-iron points, of one, two, or three inches width, or cast-iron or steel hoes, of nine inches width; with these latter any part of the land will be cut. They are readily taken off and exchanged.

#### *Directions for using the Scarifier.*

In using the scarifier, attention should be paid to set it level, and the depth of scarifying may be varied from one to ten inches, which is done by means of the two levers.



When the land is very hard, and required to be cut clean, first use the chisel points, and then follow with the wide hoes.

The chisel points should only be used on clover leys; the roots of the clover being too tough for the hoes, and are not required to be cut up.

The horses should be kept in a direct line, and *the implement not suffered to turn without taking the fore part out of the ground by means of the long lever*. Particular attention should be paid to this; for although the slanting direction in which the tines are set will bear the draught required while the horses go straight forward, they cannot stand against the twist, if the scarifier be turned round before the front tines are taken out of their work. It is also needful to observe, that the draught iron from the fore wheels, upon which the whippetrees hang, should be suspended by the draught chain higher than where the three draught irons (when in work) go upon the upright part of the fore axletree; otherwise this may bend or give way.

The wheels, on either side, may be made to go higher or lower by shifting the coupling irons, where holes are made for that purpose, where one wheel has to work in the furrow; which may be the case when a stretch is scarified by going on one side of it, and coming back on the other.

It is essential to have whippetrees adapted to the implement; if otherwise, it will fail to scarify up the foot-marks of the horses. In this respect, the largest sized scarifier has decided advantage when three horses are used, and No. 2 when two horses only are applied.

On land in course of preparation, three horses only will be required, driven abreast. On land immediately after the crop, four horses are commonly required.

*These remarks, as to horses, apply to the large implement with nine tines.*

The scarifier is usually sent with chisel points affixed to the tines, as shown in the engraving. It is desirable to have an extra supply of hoes and points, and a tine or two, to repair for wear or accident. A pair of wood shafts are sent with the scarifier, to use when travelling on the road, or removing from one part of the farm to another.

Hoes of  $4\frac{1}{2}$  inches wide, for partial hoeing, and 9 inches wide, to cut the land close, are sent to order; and when used, these, instead of the chisel points, should be fixed on the tines; but they are seldom wanted, except when the land is very dry and in fine tilth. Thistles and similar weeds are then cut up, and left to perish, standing where they remain, without the earth being turned over.

Stubbles may be broken up by the scarifier for trifolium; and tares may be sown after this implement without ploughing.

In laying down a field for grass, the scarifier may be used, as it serves to clean the land and leave it level.

**Rollers.**—There are none of these implements peculiar either as manufactured or invented in the county; although the drill-roller, which Mr. Young says was invented in Norfolk, the double barley roller, and Crosskill's clod-crusher, are all extensively made and used in the county.

**Drills.**—The drill invented by the Rev. Mr. Cooke, a clergy-



man of Heaton Norris, Lancashire, was the original of the Suffolk drill. The general appearance, so far as regards the seed-box, coulter, with tin funnels, the delivering the seed from cups, and the mode of action by cog-wheels, were similar.

About the year 1790, Henry Baldwin, a farmer of Mendham, aided by an ingenious workman named Samuel Wells, improved upon the drill known as Cooke's drill, which at this time was in use in several parts of Norfolk.

The improvement consisted—

1st. In making a *sliding axle-tree*, by which the carriage-wheel could be extended at pleasure to the width of the "stetches," or lands, and by which means another box with cups and more coulters could be used. Thus a drill containing fourteen coulters could be enlarged to one of eighteen or twenty.

2nd. In making *self-regulating levers*, to which the coulters were attached; this was done by hanging each coulter on a distinct lever, placed at right angles with the cross-bar of the framing, upon which each lever was made to swing by an ordinary hinge-joint, and had a moveable weight at its opposite end, to press the coulter into the soil.

By the levers being thus contrived to work independently of each other, they accommodated themselves to the irregularity of the surface of the land, and the impediments they might meet with, without disturbing the whole. The above were two very important improvements, and they are both in use to this day.

*Suffolk Corn and Manure Drill.*—Following the improvements just referred to are those by James Smyth, of Peasenhall, and his brother Jonathan Smyth, of Sweffling, who have been engaged in the manufacture upwards of forty years, and by whose unremitting attention to the practical operations of this valuable machine it has been brought to a high degree of perfection. A brief summary of their improvements is as follows:—

1st. A mode of adjusting the coulters to distances apart from each other, from  $4\frac{1}{2}$  inches and upwards.

2nd. An improved manure-box, and cups for the delivery of manure with the corn.

3rd. A plan to drill in manure and corn, and sow small seeds, at the same time.

4th. The swing-steerage, by which means the man attending the drill can move the coulters to the right or to the left hand, so as to keep the straight and parallel lines for sowing the seeds.

5th. Various improvements in gearing and driving the wheel-barrels, &c.

These machines continue to be made by the Smyths of Peasenhall and Sweffling, and by Garrett and Son, of Leiston, in Suffolk, which latter have also added some improvements to

admit of the adaptation of the same drill to various purposes, for which they have obtained a patent.

These improvements consist—

1st. In the application of a double-actioned stirrer to the manure-box, which, having a perpendicular and also a revolving movement, constantly disturbs the manure, and presses it forward into the department for the depositing barrel to act upon it, and by which means the manure, even when coarse or badly prepared, is equally distributed.

2nd. A contrivance by which the difficulty arising from the different weight of seeds when two or more descriptions of seed are to be sown together, and which has a tendency to cause them to be distributed in unequal quantities, is avoided. This is accomplished by an arrangement which allows the small heavy seeds, as clover and trefoil, to be delivered from cups, while the lighter seeds are by the same operation brushed out of a separate compartment in the box down the same conductors as the other seed.

The Suffolk drill is now the kind in the most general use throughout the kingdom, and is adapted either for drilling corn on level lands or on ridges, and on all descriptions of soil. It is, as stated in the previous description, furnished with *independent levers*, by which the coulters are *each* readily and separately made to avoid any rocks or irregularities of the ground, and a press-bar, extending over the entire width of the machine, to force the coulters in case of need into hard ground, with a varying degree of pressure according to the texture of the soil.

The coulters can be set so as to drill the corn at any width, from four inches to a greater distance; they also, if required, readily allow of the introduction of the horse-hoe; and, from being placed in double rows, they admit, when at work, large stones to pass between them, of a size that, under the old plan of placing the coulters in one line, would break or stop the machine. The most complete drills are furnished with the "swing steerage" before referred to, by which the drillman keeps the rows at exact or even distances from those which have been previously drilled. The corn-barrel is made to deliver from two pecks to six or seven bushels or strikes of seed per acre; and they are furnished with an additional barrel for drilling turnips and mangold-wurzel. These barrels, by a simple yet efficient "regulator," are kept on unequal hilly ground at the same level, so that the grain is equally delivered in whatever situation the drill may be placed.

A "seed-engine" is also sometimes added to the common corn-drill, by which the grass-seeds and clover are sown at the same time as the corn, and each kind of seed, if required, separately. By this plan any quantity per acre of the seeds may be

much more evenly distributed than by mixing them up together. For these seeds, being of different sizes and weights, are in the ordinary seed-engine very apt to separate in the boxes, and thus the brushes too often deliver them in unequal proportions.

The weight of these drills necessarily varies with the number of coulters, ranging from 3 to 10 cwt. ; they are drawn according to circumstances by one, two, or three horses; the sliding axle-tree, allowing the addition of any number of coulters, adapts the drill to different breadths of land.

The manure-box may be taken on or off at pleasure. It is a simple yet accurately-working apparatus for delivering the manure, which it does with great evenness, and in quantities varying as the "slip" is placed, from six to eight bushels per acre. In the best drills, also, a very important improvement has been made within the last few years, which consists in the use of separate coulters for manure and seed. The manure is now deposited according to the mode preferred by the cultivator, not only from two to three inches deeper in the ground than the seed, but from ten to twelve inches in advance of it, so as to give the soil time to cover the manure before the next coulters deposit the seed; whereas on the old plan of depositing the seed and the fertilizer together down one pipe, an evil was liable to arise; when it was used with some of the more powerful artificial manures, the seed and the manure were too close together, and the manure was not dropped with certainty in its best position—*under* the seed.

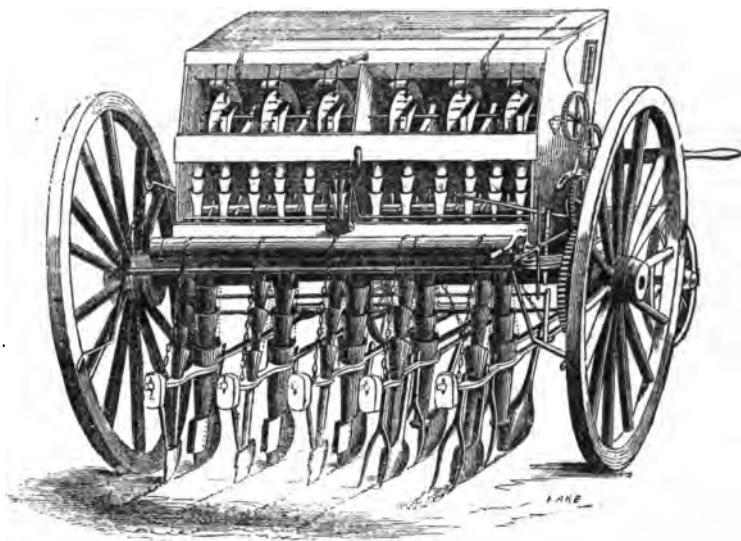
"*Garrett's Drill for General Purposes.*—In giving a brief description of the drill for general purposes, it will be better, in order to render it as intelligible as possible, to divide it into the following parts, and to describe each of them in their different capacities :—

- " 1. As a drill for artificial manures and corn or seeds.
- " 2. As a simple corn or grass-seed drill. And
- " 3. As a turnip or mangold-wurzel seed and manure drill.

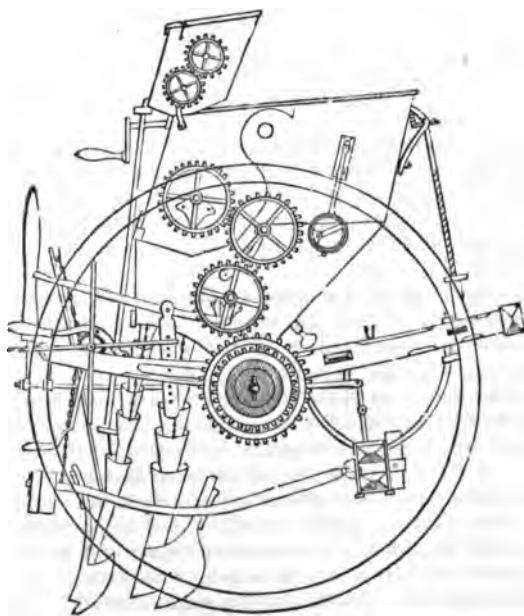
" In the first place, it is adapted to drill corn or seeds, with or without manure, in any required quantities, and at any distances apart.

" Corn may be deposited down separate conductors from the manure, or through the same pipes, either mixing them together, or separating them by a portion of mould being placed between the manure and seed, by rakes or drags provided for that purpose.

" In order that a continued and regular supply of manure may always be falling from the manure-box, a double-action stirrer is introduced into it, having a perpendicular as well as a revolving motion, by means of which the manure (which in the drills hitherto in use frequently clogged and hung back in the box, so much so as to require the attendance of a person to prevent it) is constantly disturbed and pressed forward into the department for the depositing barrel, causing an equal distribution in exact quantities of the most coarse or badly prepared



**Garrett's Drill for General Purposes.**



**Side View.**

artificial manures, or well-rotted farm-yard dung mixed with a small proportion of soil or ashes.

"It is likewise desirable to be able to regulate the delivery of manure as the drill travels, as in going over several acres of land many portions may be found much richer than others, especially in places where the better soil has been washed (by continued wet) off the hills into the valleys. To ensure this variation of delivery, a slide is placed before the mouth of the manure-box, worked easily up and down by turning a small wheel at the back of the drill, so that without stopping the progress of the implement the man in attendance may alter the quantity as occasion may require.

"The engraving (bottom of preceding page) represents a side or end view of the drill. The ends of the drill-boxes are made of iron instead of wood, allowing the travelling wheels to run half the distance from the outside coulters at which the others are set, and so returning in the same wheel-marks that they made in going the contrary way of the field, to leave the rows all the same distance apart. This improvement extends also to making drills to cover half-rod lands, without the necessity of an additional part to put it in the field; the full spread of the drill-wheels outside being no more than will admit of its passing through gateways of the ordinary dimensions, viz.  $8\frac{1}{2}$  feet.

"R. G. and Son have now adopted the use of Stratton's patent hollow wrought-iron for the cill or side-frame, being much more durable than when made partly of wood and partly of iron, and no possibility of breakage, as when made of cast-iron; it affords a ready mode of altering the height of the box, to receive the different sized cog-wheels, as the upright centre upon which the box rests is raised or lowered by a screw numbered to correspond with the teeth in the wheels, so that no difficulty can arise in their being adjusted and kept in proper gear with the greatest precision.

"As a more convenient and easier method for the man in attendance to raise the manure-box, when full, in and out of work, a compound lever is applied, by means of which less than half the power formerly necessary for the purpose will now suffice; the attendant may easily throw both boxes, when fully loaded with manure and corn, in and out of gear as the drill travels.

"In the second place, we come to the drill when used simply for corn or grass-seeds. When the implement is required for either of these purposes only, *the whole of the manure apparatus may be removed*, leaving it a light corn or seed drill.

"The merits and form of the Suffolk corn-drill are familiar to agriculturists generally, it remains therefore but to point out the latest improvements which have brought it to its present state of perfection, and classed it among the most complete implements of agriculture. Among these may be enumerated as the principal, the simple apparatus provided to ensure a regular delivery of the seed when going up or down hill; in descending, a drill has a peculiar tremor and a tendency to go faster than when ascending, giving a greater velocity to the delivering-cups, and consequently throwing more seed down the conductors; to remedy this, and render the delivery from the barrel as uniform as

possible, two cog-wheels, of different speeds, are placed one on each end of the barrel; either of which may easily be put in or out of gear as required, and worked at alternate ends; the small wheel when going up hill, and the large wheel when going down.

"The seed-engine accompanying this drill is adapted to sow at the same time with spring corn, or may be used as a separate implement for grass-seeds, broadcast, or turnips and mangold-wurzel in rows. In order to ensure an equal delivery of the different kinds of seed, the box is partitioned off into two departments, one for heavy seeds, such as clover, trefoil, &c., and the other for the lighter seeds, such as rye-grass: the former being delivered from cups, and the latter from brushes, down the same conductors with it. Thus the required quantities of each seed are nicely mixed and evenly sown all over the land, and may be regulated by turning the screw at the end of the box for rye-grass, and changing the wheels on the cup-barrel for clover, &c. When this addition is wanted, the levers of the drill must be made of iron instead of wood.

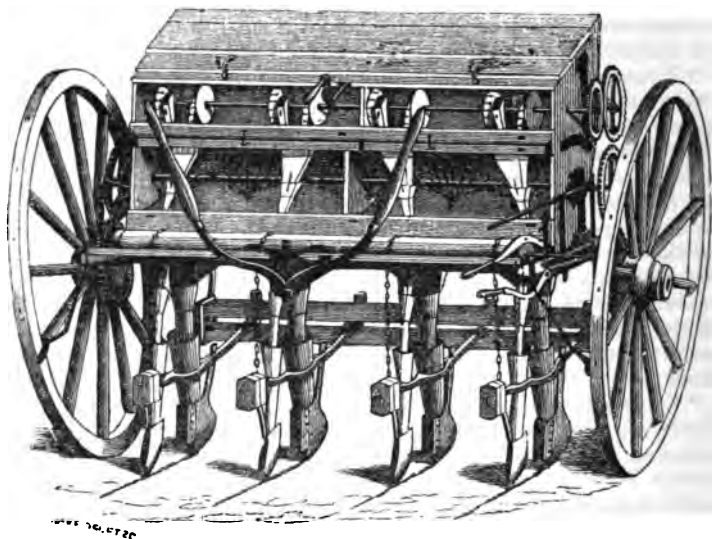
"By the new steerage machinery, which acts as a fore-carriage to the implement, a man may keep the rows of corn perfectly parallel with the preceding course of the drill. This is done by a man holding the steerage handle, and keeping the small fore-wheels in the track of the former large one; this, with a little practice, is very easy, and will amply repay by the perfect regularity in the crop, affording the greatest facility for the horse-hoe going between all the rows of plants, and with equal precision, where the drills join in their different courses through the field. The swing-steerage, at a less cost, and managed without an additional attendant, is amply sufficient where the drill covers each stretch, or land, in twice.

"Lastly, as a turnip and manure drill it may be used to suit all methods of cultivation, whether on flat lands or ridges, as the axletree may be made to slip, so as to alter the sizes to the different widths of ploughing. The distances of the rows may be varied at pleasure.

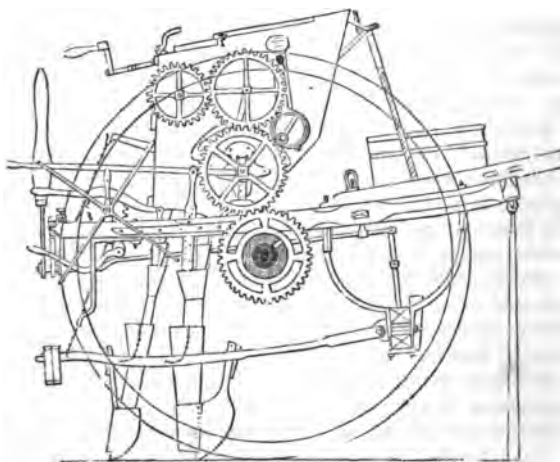
"The manure is deposited in a continual stream down the large conductors, in any required quantities, and covered by the drags or rakes with soil to any depth, before the seed (which passes through different pipes) is sown upon it; the seed is then lightly covered with mould, by chain-harrows suspended from the end of each lever."

"*Garrett's patent Lever Drills, for Turnip, Mangold-wurzel, and other Seeds, with Manure.*—These drills may be used to suit all methods of cultivation for the vegetable crops, being made to work with any number of levers, having axletrees to slip, so as to alter the sizes to the different widths of ploughing, and parallel swing or fore-carriage steerages, enabling the man in attendance to guide the coulters or drill without depending on the driving of the horses.

"On stretch or broad work the rows of seed may be deposited from 12 inches to any wider space. In these drills the turnip and mangold-wurzel seeds are taken up separately by the cups, but deposited together down the conductors, so as to prevent any unequal mixture of the seeds; the novelties and improvements in the manuring machinery are same as in Drill for general purposes, with the manure-box and apparatus



Garrett's Patent Lever Drill.



Side View.

made large, for depositing any quantity of every kind of artificial or well-rotted farm-yard manure.

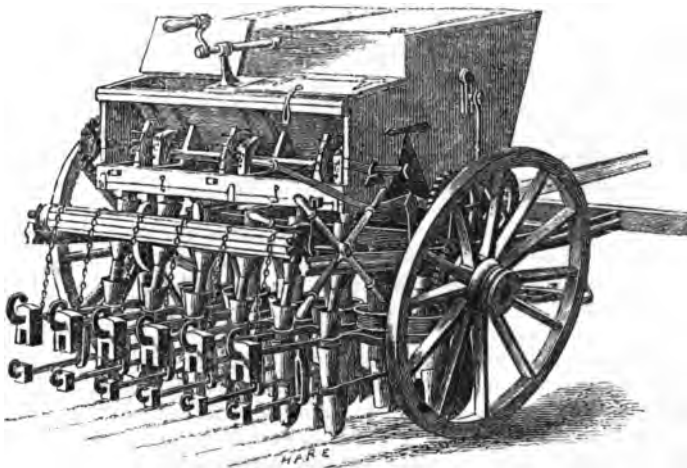
"With the addition of another barrel, these drills may be used for depositing peas and beans at 12 inches or wider apart."

"*Garrett's patent Lever Ridge-Drill for Turnips or Mangold-wurzel, with Manure.*—This drill is made of two coulters, and is intended for ridge-ploughed lands, having the same improvements and advantages in the manure department as the Drill for general purposes, with the improved slides to regulate the quantity of manure placed directly under the management of the attendant who follows the drill, and may be altered while the implement is proceeding in its work, admitting larger or smaller quantities, as may be required on hilly lands or various qualities of soil.

"In order to accommodate the drill to irregular ploughed ridges, a pair of rollers are attached to a fore-carriage, so as to form and press the land properly for the deposit of the manure and seed; and what has hitherto been found a difficulty in keeping the depositing coulters on the tops of the ridges is remedied in this, by the levers being easily steered by a parallel movement, so that the seed-coulter advances in the exact line of the manure-coulter.

"The rakes add greatly to the effective working of the drill, those foremost filling up the channel left by the large manure-coulters, and thus permitting the seed-coulter to make its work in fresh-stirred mould directly above the manure, and the latter rakes will sufficiently cover the seed, leaving a slight dip for retaining the smallest quantity of moisture."

"*Garrett's patent Kentish Drilling-machine.*—This drill is for the general purposes of a farm, and is peculiarly adapted for lands that are ploughed flat, so that the travelling wheels are not required



Garrett's Patent Kentish Drilling-Machine.



to go in deep furrows. It has one barrel for delivering wheat, barley, oats, beans, peas, or carrots, and another for turnip and mangold-wurzel seeds. When the manure machinery is not wanted, it may be all removed, and leave the drill simply for corn or seeds. The travelling wheels are only 48 inches high, so that the top of the manure-box is barely  $4\frac{1}{2}$  feet from the ground, and the corn-box, when working without the manure, is only  $3\frac{1}{2}$  feet high above the ground, and the depositors or coulters are so arranged that those on the outside are only half the distance from the wheels that one coulter is from the other, so that the original wheel-mark is the guide for the return wheel to travel in, and the rows are all thus made regular distances apart, and parallel with each other.

"The manure coulters and depositors are hung on separate levers, working perfectly independent of those for corn and seeds, and those for seeds still following in the same track as those with manure, and are pressed into the ground by separate sets of weights, from which arrangements there is no difficulty in depositing both seeds and manure regularly any depth, on any description of lands, however hilly or uneven.

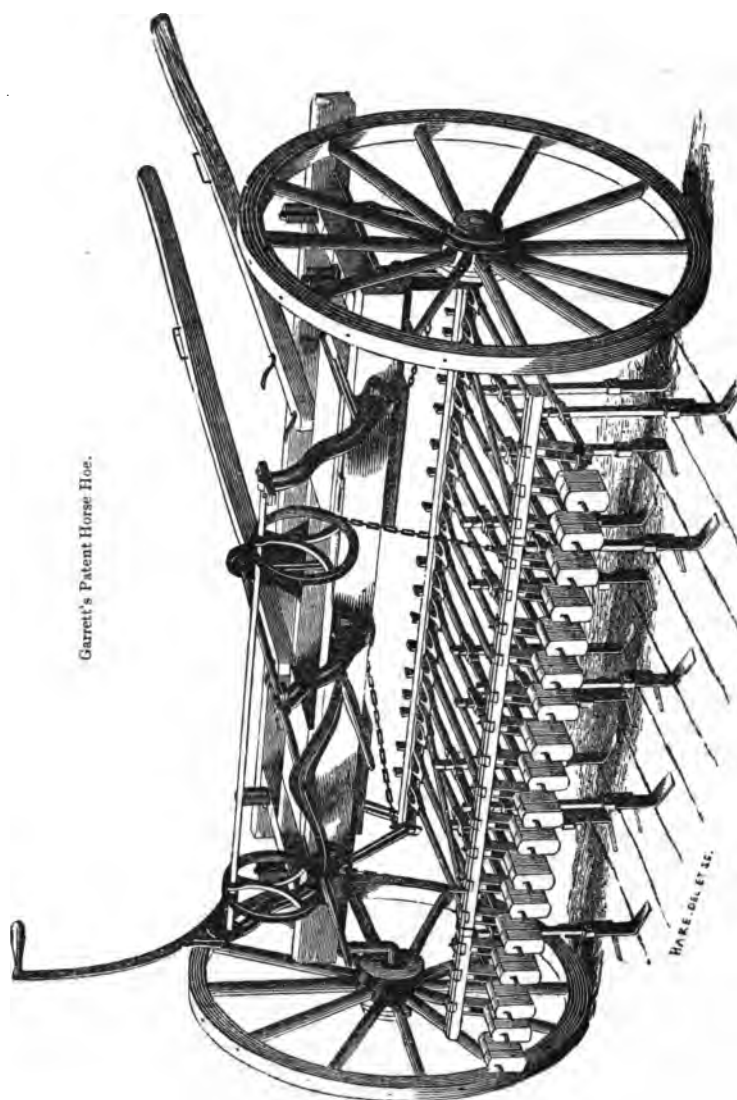
"Another feature of importance in this drill is the shape of the box and arrangements of the manure machinery, which, instead of being lifted by a barrel, and turned into spouts behind, has an opening made for the easy escape of the manure, at the bottom of the box, and directly underneath the barrel, which may be regulated as the drill travels, ensuring a more ready delivery, with less labour to the horses. All sorts of manure, from the finest rape-dust to the well-rotted farm-yard manure, may be deposited in any quantities."

"*Garrett's patent Horse Hoe.*—This implement is so complete in itself, as to be fully suited to all methods of drill cultivation, whether broad, stetch, or ridge ploughing; and is adapted to hoeing corn or pulse of all sorts, as well as roots. The peculiar advantages of this implement are as follows:—

"It may be increased or diminished in speed, to suit all lands or methods of planting; the axletree being moveable at both ends, either wheels may be expanded or contracted, so as always to be kept between the rows of plants.

"The shafts are readily altered, and put to any part of the frame, so that the horses may either walk in the furrow or in any direction, to avoid injury to the crop.

"Each hoe works on a lever independent of the others, so that no part of the surface to be cut, however uneven, can escape; and in order to accommodate this implement for the consolidated earth of the wheat crop, and also the more loosened top of spring corn, roots, &c., the hoes are pressed into the land by different weights being hung upon the ends of each lever, and adjusted by keys and chains to prevent them going beyond the proper depth. What has hitherto been an insuperable objection to the general use of the Horse Hoe is overruled in this, by the novel and easy method of steering, so that the hoes may be guided with the handle behind to the greatest nicety, doing every execution among the weeds without injury to the crop.



Garrett's Patent Horse Hoe.

"It is so constructed that the hoes may be set to any width, from 7 inches to any wider space. For the purpose of hoeing all kinds of corn the inverted hoes *only* are preferred; but for the root crops, where the rows of plants are wider (say 16 inches, or more), an extra hoe of a semicircular form is placed on a separate lever, working between and in advance of the two inverted hoes, for the more effectually cutting all the land, however uneven the surface, by two or three separate hoes working independently of each other between the rows.

"The hoes are of a peculiar improved manufacture, the blades are made of steel, and attached separately to a socket stalk in a simple and easy, yet effectual manner, so that any husbandman may replace them, and being manufactured by the patentees at an exceedingly low price, no difficulty can arise in replacing those parts subject to wear, and thereby keep the implement in good working order.

"In order to set the hoes in a proper cutting position, for either flat or stretch-ploughed lands, and so as thoroughly to cut either hard or soft ground, the levers may be put into a more or less oblique position, causing the cutting edges of the hoes to be more or less inclining downwards, by raising or lowering the jointed irons to which the forward ends of the levers are suspended and swing, which is done by merely moving the pin, which rests upon the frame, into different holes.

"An arrangement is also made whereby the furrows on stretch or ridge land may be hoed; and likewise the rows on flat lands, between which the wheels travel. This is done by having the outside hoe working behind the travelling wheel, which, returning between the same rows, hoes one half of the row in going one way of the field, and the other half in returning. If, however, the two rows where the drills join the work be irregular in distance apart, and in places nearly meet, the hoe may instantly be thrown out of work by means of a spring catch provided for the purpose."

*Extracts from the Journal of the Royal Agricultural Society of England.*

The following are the remarks of judges of implements, on R. Garrett and Son's patent Horse Hoe, in their reports of the Royal Agricultural Society's meetings, at Liverpool, in 1841, and Bristol, in 1842.

"Messrs. Garrett and Son's hoe deserves the notice of the agriculturists, as an implement that will greatly tend to give an horticultural finish to field operations. It is adapted to all the prevailing methods of drill culture, either for the cleansing of crops, drilled upon the level surface or on ridges, the axle of the wheels being moveable at both ends, to suit the varied intervals between the rows of plants, and as each hoe works on a separate lever the weeds are effectually destroyed, however uneven the surface of the ground, each hoe being kept at a uniform depth by means of regulating keys. The swing steerage adapted to this implement is a valuable addition to horse hoes, as they may thereby be guided with the greatest precision, perfectly scarifying the intervals without the possibility of injuring the corn or plants."—*Vide Royal Agricultural Society's Journal*, vol. ii., Appendix, p. 110.

"The excellent implement of Messrs. Garrett and Son, still further im-

proved, was again selected for the Society's premium, as eminently calculated to answer the various ends to which it is applicable, as noticed in our last report."—*Royal Agricultural Society's Journal*, vol. iii. p. 344.

At Derby, in 1843, "The well known horse-hoe of Messrs. Garrett and Son, rewarded both at Liverpool and Bristol, was exhibited with improvements, rendering it still more complete in its fittings and adaptation to follow the drill in the various forms of culture to which the latter implement is applied. The silver medal was awarded for these improvements."—*Royal Agricultural Society's Journal*, vol. iv. p. 482.

Extract from the writings of Hewitt Daves, Esq., 3, Frederick Place, Old Jewry, London :—"As Garrett's horse-hoe is calculated to work a most important reform as regards the cleaning of land, and as I have practically tested its utility, I may be permitted to bring it under the consideration of your readers. By its use all corn sown in rows, from nine inches upwards, may be hoed in a superior manner, and at an expense of only one shilling per acre. Having at first great doubts of the possibility of any implement drawn by a horse being used in the narrow intervals of cereal plants, I began by buying one. I have now four; and that I may apply it also to my young clovers I have had made a new drill on purpose to put in the clover seed midway between the rows of corn. My practice for many years has been to hand-hoe in the spring all my corn; as well to move and lighten the ground, as to get rid of the weeds. The use of the horse-hoe has the advantage over the hand-hoe, besides saving of expense, that its work is much more perfect; the depth it penetrates is greater, and ten acres a day may be done with a horse, and man and boy. Farmers are far too little alive to the mischief that weeds among their corn do them, still less to the fresh life and vigour that a moving of the earth round a growing plant affords; in this they may with great advantage take lessons from gardeners; and the implements of Messrs. Garrett enable them very effectually, and at little cost, so to improve their practice."

The following is an extract from a letter written by P. Pusey, Esq., M.P., to the Council of the Royal Agricultural Society, on horse-hoeing flat-drilled turnips.—(*Vide Royal Agricultural Society's Journal*, vol. iv. p. 77.) After writing upon the merits of the hoe, Mr. P. remarks, "As any mere trials, however, are less satisfactory than the actual work on a farm, I have obtained an account of its working from practical authority, and the following statement of its performance will, I trust, be satisfactory. Several farmers I know regard this horse-hoe as one of the best implements lately invented. On an arable farm of 400 acres, the price, which varies from 19*l.* to 13*l.* 10*s.*, might be saved by its use, I should think, in the first season."

*Directions for altering the Hoes to suit the different Widths and Methods of Planting.*

Row No. 1.



Row No. 2.

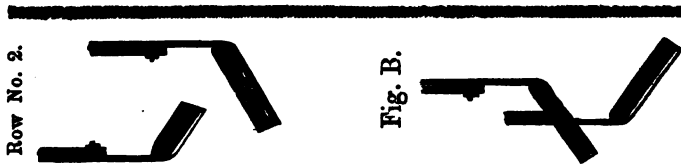


Fig. B.

Row No. 3.



Fig. C.

Row No. 4.

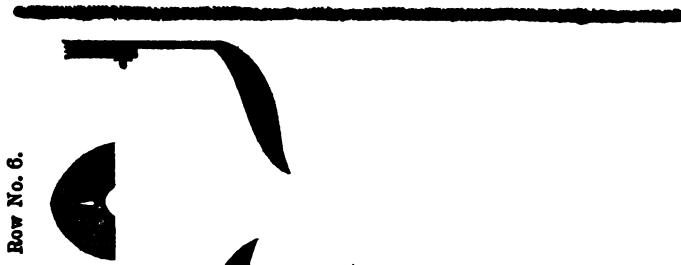


Fig. D.

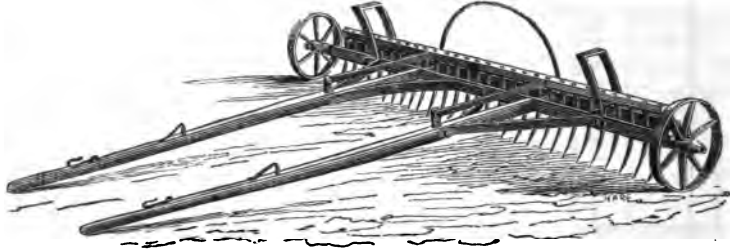
Row No. 5.



Row No. 6.

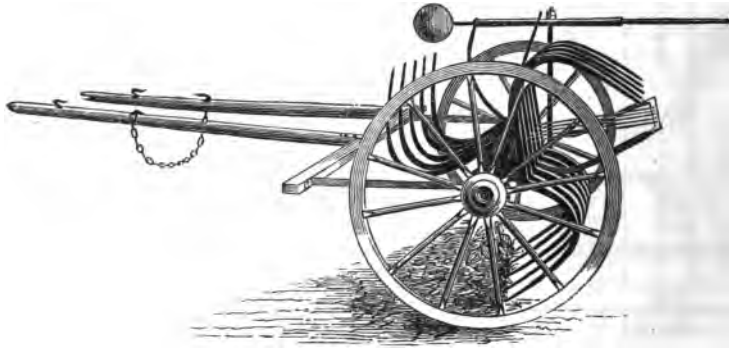


| Row.   | Supposed<br>Description of Crops.           | Distance between the<br>Rows. | Description and Size of Hoes<br>to be used.                              | General Remarks.   |
|--------|---|-------------------------------|--|--|
| No. 1. | WHEAT . . . .                               | 7½ to 9 inches . . .          | Two 4-inch inverted hoes.  |  |
| No. 2. | PEAS, BEANS, or ROOT-<br>PLANTS.            | 10 to 11 inches . . .         | One 4-inch and one 7-inch<br>inverted hoes.                              | When the plants become large and spread, the<br>levers should be set quite close together, in<br>order to make room for the leaf to pass clear<br>of the stalk of the hoe: two 7-inch blades<br>may be used, set as shown Fig. B, in this row;<br>or one semicircular hoe, as shown in row No. 3,<br>Fig. C. |
| No. 3. | PEAS, BEANS, TURNIPS, or<br>MANGOLD-WURZEL. | 12 to 13 inches.              | Two 7-inch inverted hoes.  | When the plants become large, &c., as de-<br>scribed No. 2, reverse the hoes as shown Fig.<br>B, row No. 2, or work only one semicircular<br>hoe in the row, as shown Fig. C, row No. 3.   |
| No. 4. | TURNIPS and MANGOLD-<br>WURZEL.             | 14 to 19 inches . . .         | One 7-inch and one 4-inch<br>inverted hoes, and one<br>semicircular hoe. | When the plants become large, &c., as de-<br>scribed No. 2, the 3 levers should be moved<br>nearer together in the row, and the inverted<br>hoes reversed, as shown Fig. D, row 4.   |
| No. 5. | TURNIPS, MANGOLD-WUR-<br>ZEL, or POTATOES.  | 20 to 26 inches . . .         | Two 7-inch inverted hoes<br>and one semicircular hoe.                    | When the plants become large, &c., as de-<br>scribed No. 2, the inverted hoes to be reversed,<br>as shown Fig. D, row 4.   |
| No. 6. | TURNIPS, MANGOLD-WUR-<br>ZEL, or POTATOES.  | 24 to 32 inches . . .         | Two twisted inverted hoes<br>and one semicircular hoe.                   | These are intended for ridge-ploughed lands,<br>and the same arrangement of hoes will apply<br>to narrower ploughed ridges.  |

*Rakes.*

Suffolk Horse Drag-Rake.

*Suffolk Horse Drag-Rake.*—This rake is for the purpose of raking barley stubbles, &c., after the corn has been carried; and the rubbish may be cleaned from the tines simply by lifting the rake at the handles, when the teeth will come up together between the bars of the fixed frame, and leave the rubbish raked up neatly in the field. This tool may be considered an improved and more compact variety of the Norfolk horse-rake. The defects of both implements consist in the circumstance of the tines being rigidly fixed in a cross head, and therefore continually liable to be broken in uneven or stony land: they are therefore inferior to the lever horse-rakes.

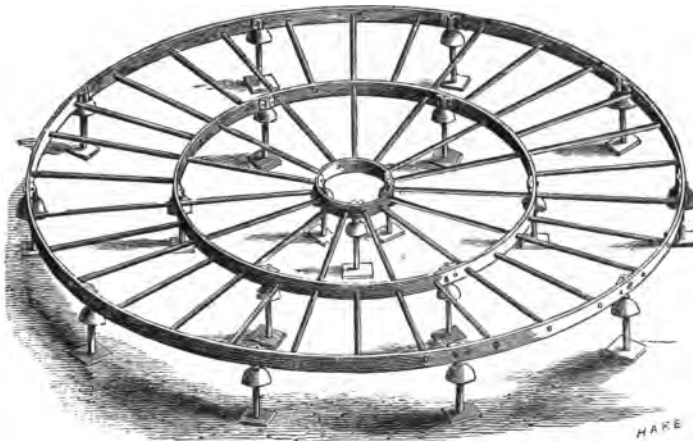


Biddell's Patent Corn-Gatherer.

*Biddell's patent Corn-Gatherer.*—This is an implement of novel construction and unquestionable utility. It will enable a company of harvestmen to begin loading when the corn is dry, without the usual delay, while corn is being raked into heaps, or, as they are called in Suffolk, "shocks," for pitching. In the busy time of harvest it saves manual labour, not only in gathering up swathes (without stopping the horse), but the corn, when so gathered, being compressed, may more readily be pitched, and a greater quantity be loaded upon a waggon, and got into the same barn-room, than if raked together in the usual way.

Implements hitherto made for the above purpose have been difficult

to unload, even with the application of great strength to lift them over the gathered heaps. Biddell's corn-gatherer is for gathering one swathe of corn at a time, and has the advantage of leaving its load, at the will of the attendant, without being lifted up. One of three rows of tines alternately begins to gather the swathe as soon as the previous row has finished its heap, the size of which may be regulated as required for one or two forks full.



Wrought-iron Corn-Rick Stand.

*Wrought-iron Corn-Rick Stand*, invented by the late John Sprin-gall, may be considered the most portable, convenient, and economical stand in use. It has of late years been very extensively adopted in Norfolk and Suffolk, and has always been found to preserve the stack from injury or destruction from vermin, it being impossible, unless anything be left against the stack, for them to ascend. A further great advantage is secured by their use, by the facility they afford for securing crops in moist seasons, as the free current of air which is admitted under and through the stack soon hardens the crop after the rick is on the stand, rendering the sample of corn in all seasons much harder and drier.

They are made of different sizes, and may be taken to pieces and packed in a small compass for convenience of carriage, and present a much better and more sightly appearance than the stack-frames generally used throughout the country.

#### *Threshing-Machines.*

The machines now in general use in Suffolk and the eastern counties of England are, with few exceptions, portable; they are frequently the property of individuals, who, itinerating from farm to farm, thresh at a certain price per quarter, the farmer finding



horses, and, with the exception of the proprietor, who feeds the machine, the necessary complement of men. They are simply *threshing-machines*, having neither circular rakes nor fanners attached. The beaters—four, five, or six in number—are so placed round the drum that their beating edges radiate from the centre. These strike upon the straw, which is passed along a feeding-board placed at an inclination of about thirty degrees, tending to a point equidistant from the centre and upper part of the circumference of the drum. The *concave*, or *screen*, which surrounds the drum describes the third part of a circle, and is formed alternately of iron ribs and open wire-work in segments, so placed that its inner surface may be brought into near contact with the edges of the revolving beaters, and admitting of adjustment by screws to increase or diminish the distance. The usual plan is to place it within about an inch and a half space at the feeding part, and gradually to diminish the distance to an inch, or three-quarters of an inch, at the lower end, where the straw is delivered upon a fixed *harp*, or *riddle*, through which such part of the grain as is not driven through the wired part of the concave falls, while the straw is removed by forks.

The threshing part, commonly called the barn-work, occupies a space of 6 feet by 4½ feet, and, together with the apparatus by which motion is communicated (which is made either for two, three, or four horse-power), may at pleasure be elevated upon a pair of wheels and axle, and thus removed by two horses.

With these machines, properly constructed, barley may be thoroughly threshed with as little damage as with the flail; and wheat straw need not be so broken as materially to diminish its usefulness, even for the purpose of thatching.

Where, however, as in the near neighbourhood of London and other large towns, the straw is valuable as an article of sale, and it is necessary that it should be tied in bundles or bolts, another variety of the threshing-machine, called a bolting-machine, may be advantageously used. The general character of this machine is not very dissimilar to that just described, with the exception that the drum and concave are made of sufficient width to admit the sheaf lengthwise of the straw, instead of presenting the ears foremost; the drum is not, as in the former case, a skeleton with beaters, but is a cylinder entirely cased with plate-iron, and forms what is called a *whole drum*; upon this the beaters, eight in number, are placed longitudinally: they are formed of small strips of iron, projecting not more than a quarter of an inch; the concave extends about three-fifths of the circumference of the drum, and the sheaf is introduced between two feeding rollers, as in the older machines, in order to prevent too great a quantity or too thick a wad choking and clogging the machine, which neces-

sarily requires to be adjusted, so as to leave but little space between the drum and concave.

When this machine is required to thresh beans or peas, two wooden beaters, projecting about an inch from the surface of the drum, are added, and the concave is set at a proportionate distance.

The operation of this machine, as compared with the one previously described, is slow, but its performance is very perfect; the corn is disengaged from the ear without damage, and the straw is left as straight and unbroken, and as ready to be made up into bolts, as from the flail.

I am not aware to whom the original invention of this machine belongs, but it has been much improved and brought to its present state of perfection by R. Garrett and Son, Leiston.

At the Royal Agricultural Society's meeting at Cambridge, in 1841, the quantity of wheat threshed in an hour by two four-horse portable machines manufactured by J. R. and A. Ransome, of Ipswich, and R. Garrett and Son, Leiston, was respectively sixty-one bushels and three-quarters of a peck, and sixty-one bushels and a quarter of a peck; and the corn was clean-threshed and uninjured.

This must not be taken as a criterion on which to found an average, as it was doubtless the result of stimulated exertion; but it is not unusual with machines of this construction, with reaped wheat in fair condition, to thresh 50 quarters, or 400 bushels, in a day of ten hours, and the same quantity of mown barley.

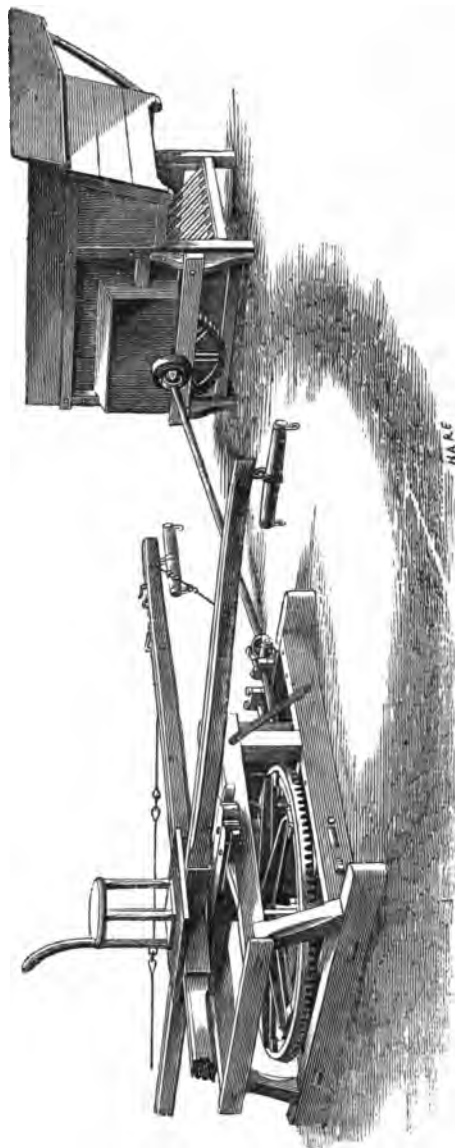
It should, however, be observed that these, having neither rakes nor fans, the work of which is done by hand, would require eight men and five boys, and a change of horses in the day,

*Ransome's four-horse portable Threshing-machine, fixed for work.*—The peculiarities of this machine are, that the large wheel is cast with the ring separate from the arms, by which the probability of breaking, and the expense of repair in case of accident, are much decreased. It is turned in a lathe, to afford a true bearing for the friction-wheel.

In order to facilitate repairs at a distance, all the wheels, except the large one, are bored, and the shafts turned to gauges, so that any one may be replaced by a common mechanic; and the brasses may in a similar manner be replaced by new ones.

In the judges' report on the implements at the Oxford Meeting of the Royal Agricultural Society of England in 1839, they especially "commend this machine for the generally good workmanship displayed in it, and the *proper proportion of its parts*, both as to durability and getting up the required speed." They stated "it was also particularly deserving of attention, from the application of the correctly-shaped toothed-wheels."—*Journal*, vol. i. p. 68.

At the Royal Agricultural Society's meeting at Bristol, in 1842, the threshing part of this machine was exhibited, in connection with a



Ransome's Four-horse Portable Threshing-Machine, fixed for Work.

portable steam-engine, and obtained the Society's highest prize of 30/.  
—*Journal*, vol. iii. p. 351.

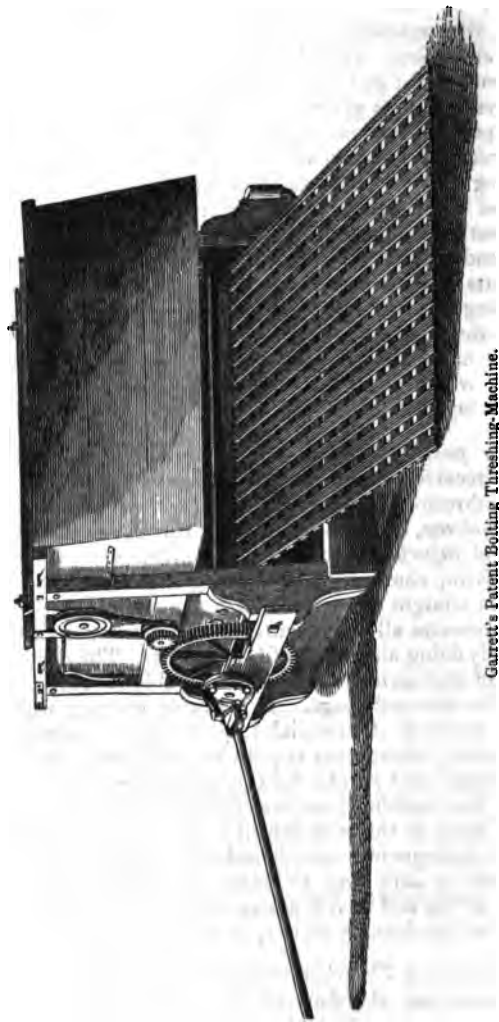
*Garrett's portable Open-Drum Threshing-machine.*—The peculiarities in this machine are that the drum or threshing cylinder is made entirely of iron, with five beaters peculiarly formed of wrought-iron, extremely light and strong, occupying less than the space of four wood beaters, and thus giving one-fifth more threshing power without increased speed or friction. The concave that surrounds the drum is likewise formed of wrought-iron ribbed plates, rendering the whole of the threshing part less liable to breakage, and very easy to repair. The machines of five and six horse-power are well suited for long, stiff straw, as that grown in fen districts. Every part of the machine is so numbered and lettered that they may easily be described in writing, so that all parts subject to wear or breakage may easily be replaced by persons living at a distance. The brasses for the various spindles are replaced in the same way.

An additional concave to surround the drum is provided: that, being substituted for the one used for general purposes, will effectually draw clover, suckling, and other small seeds.

*Garrett's patent Bolting Threshing-machines.*—This machine, which has received many prizes at various agricultural meetings, is adapted for threshing every kind of corn without so much as *bending or ruffling the straw, and will effectually thresh out all the grain without the least injury to the kernels*. It delivers the straw upon the lattice platform, shown in the following engraving, ready to be tied up in bolts more straight and regular than it can be threshed with the hand-flail, and possesses all the advantages of construction of Garrett's other machine, only doing about one-fifth less work. The drum is constructed principally of stiff spring-wire, and is incapable of being broken or injured with common care and usage. It performs its work with such extreme nicety as to render it of essential importance to agriculturists residing near large towns, where they require the straw to be tied up for sale, or perfectly straight and regular for very particular purposes. The process being more like rubbing than beating the corn, it cleans the barley off the straw without in the least injuring the kernels, an effectual remedy for the fault so frequently complained of by maltsters in other machines. There are four beaters sent to fasten upon the drum, which render it the same in effect, and nearly as expeditious, as the open-drum machine.

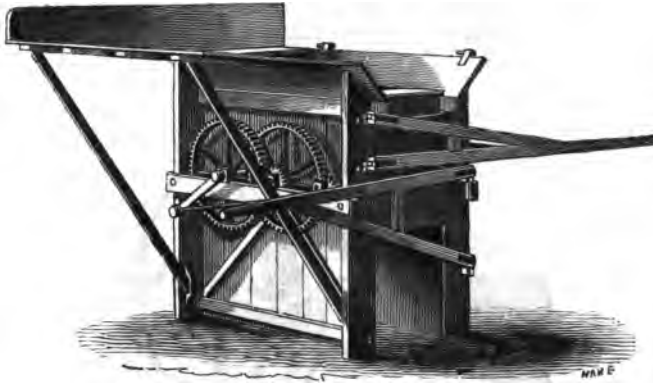
It is worked by three, four, five, or six horses.

*Ransome's Hand Threshing-machine.*—This machine is constructed to work by four men at a time as the moving power, and one to feed, with the needful helpers to take away the straw. The mode of applying the power is sometimes by two men at a crank, and two pulling at a lever, in the manner of rowing in a boat; and it is considered that changing over from one motion to the other affords a degree of relief. A more recent construction of Messrs. Ransome's is to have a crank and a lever on *each* side of the machine, so that each man has a separate crank or lever, as the case may be. Another form is to have four cranks and no levers. The advantage of a hand threshing-machine consists in its being set to work without much preparation, and that only one *skilled* labourer is required in the number employed; and thus, in weather that



interferes with farming operations out of doors, employment may be found in the barn for those who are not used to threshing by the flail. The machine threshes all kinds of grain and pulse quite clean, and at a rate of from one-third to one-half more than the same number of competent threshers employed with flails.

Garrett's hand-machines are for two and four men. The latter size better worked by one horse.

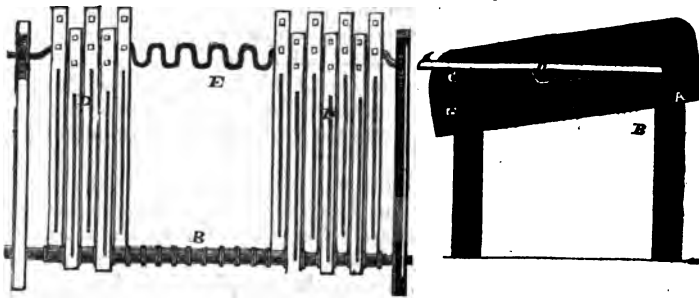


Ransome's Hand Threshing-Machine.

*Garrett's registered Straw-Shaker.*—The engraving below represents a shaker, for the purpose of thoroughly separating from the straw all corn, leaf, and rubbish that may be amongst it, and for carrying off the straw after it has passed out of the threshing-machine, fig. 1 being the elevation, and fig. 2 a plan of the same.

Fig. 2.

Fig. 1.

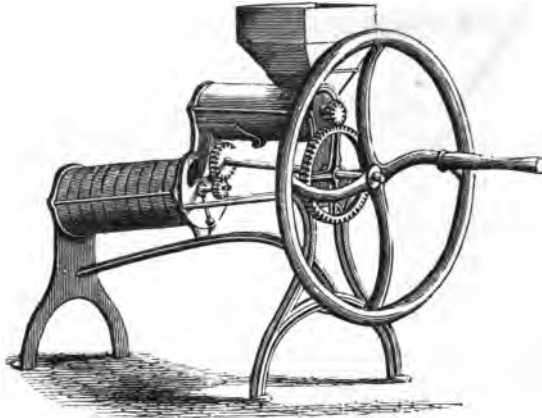


Garrett's registered Straw-Shaker.

The straw is delivered from the machine on to a series of vibrating levers (D), which form a kind of platform for its reception. These levers are each supported at one end on iron arms (A), which rock to and fro on a spindle (B), and at the other end are connected by a prolonged tine (C), which forms a rocking arm to a rotating serpentine rod, which acts like a series of cranks, and by its rotation alternately raises and depresses one-half the number of levers forming the platform. By this means (assisted by the tines shown at the end of the levers) the straw is carried off the machine, and the loose kernels, chaff, leaf, and rubbish are separated from it.

With this addition to the threshing-machine the straw is much more

effectually shaken than by the usual process with forks: its advantages will therefore be obvious to all those engaged in farming.



Barley Hummelling Machine.

*Garrett's improved and registered Barley Aveller, or Hummelling-machine.*—This machine is for the purpose of rubbing the horns or avels off barley, and improving the sample of corn by rendering it brighter and cleaner. It has a barrel full of pegs or rubbers revolving rapidly in a cylindrical case, by means of which the avels or horns are rubbed off the grain without unnecessary friction, as the process may be regulated at pleasure, accordingly as the barley may require more or less avelling to clean the kernels.

After the barley has passed through this operation, it falls through an aperture in a revolving screen, which turns at a slower speed than the peg barrel, sufficient to separate from the corn all the loose horns and other rubbish. This process has a most beneficial effect in brightening the skin and materially improving the sample of all barleys, especially such as are stained, by rendering them fit for malting purposes.

The machine is easily turned by a man, who, with the assistance of a boy or woman to attend to the feeding, will thoroughly clean from 2 to 3 quarters of barley per hour.

#### *Mills for crushing Grain.*

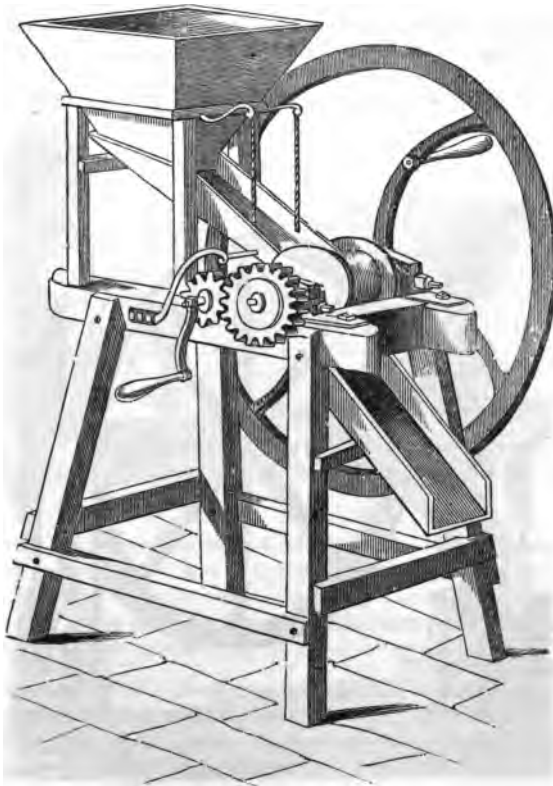
*Seammen's Bean-mill.*—This mill for grinding beans, constructed by Seammen and Bryant, of Melton, in Suffolk, is a simple and effective implement. It is placed on a wooden stand, with crank, fly-wheel, and hopper, and consists of a coarsely-fluted steel barrel, working against a cast-iron front cutting plate; the latter being set at a proper distance from the barrel by means of a screw. It is used chiefly for beans and



**Scammen's Bean-Mill.**

peas, but may be employed for grinding malt by exchanging the barrel and cutting plate for a pair of rollers.

*The Suffolk Crusher.*—This is a machine on a wooden stand, having two rollers of unequal sizes: the hind roller is finely grooved and of half



**Ransome's Suffolk Crusher.**



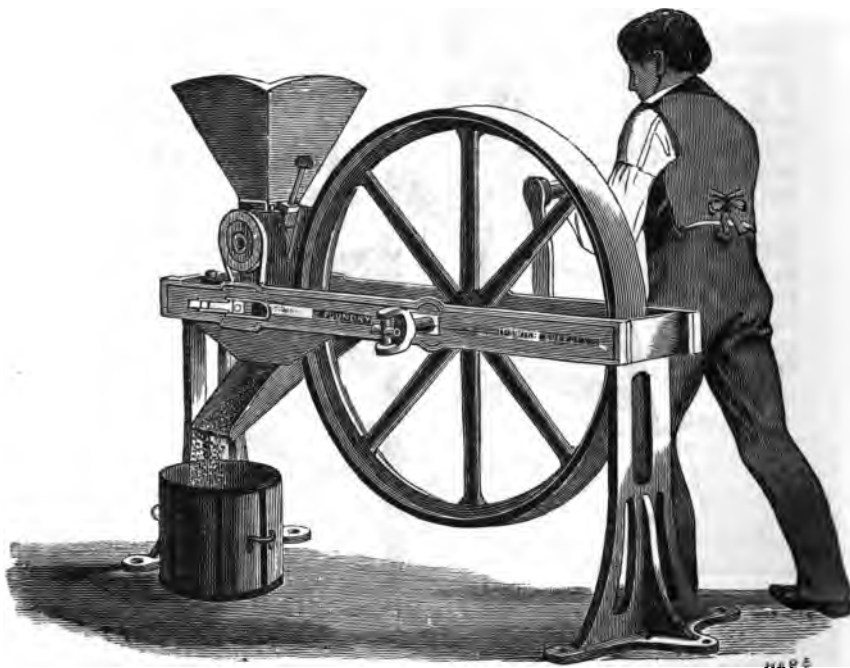
the dimensions of the front one ; this has no flange, but works within the flanges of the front roller, which are attached at both ends. To render these mills effective for crushing oats, the rollers should be left slightly rough as they come from the lathe, to draw in the kernels, as the latter are apt to start back at the moment of entering between the rollers, if they are polished.

*Bond and Hurwood's Linseed, Corn, and Malt Crushing-mill.*—The manufacturers of this much-approved mill for crushing linseed, &c. state that it has the following advantages over other mills :—

That from its simple construction, its work being performed upon the smooth surface of the large wheel and a small smooth roller, it is not so liable to get out of repair, and the purchase obtained in working is greater than that obtained by any other machine. It is made all of iron, and can be worked either by manual labour or horse-power.

The introduction of crushed linseed for cattle, from its pure unadulterated state compared with cake, is much upon the increase by graziers, being administered in such varied compounds, moist and dry, and found to contain so much fattening property as to render this mill extremely desirable to gentlemen who keep stock. The manure from seed-feeding being much superior to that from cake ; and ground linseed, mixing better with chaff, or any other food, than cake, and not so likely to be separated by stock.

Oats are crushed by this mill, and those who have carefully examined



Bond and Hurwood's Crushing-Mill.

the advantages of feeding with crushed oats, are quite satisfied the saving is considerable, as neither young nor old horses sufficiently masticate the oat so as to obtain nearly so much nutriment as when crushed.

It is also an excellent mill for grinding malt. Malt may be ground finer or coarser, faster or slower, according to the manual or other power applied thereto. One man can grind 16 to 20 bushels per hour; two men, double the quantity; horse-power, 12 coombs per hour, or upwards.

The following directions for the fixing and management of the mill should be strictly attended to:—

The mill should be fixed level upon a dry, strong, boarded floor or wood sleepers, and firmly screwed to the same by bolts or screws, at the feet of the framework.

The axle bearings should be occasionally cleaned and kept properly oiled with salad or olive oil; inferior and common oils soon thicken, and thereby occasion much friction and injury to the working parts.

The seeds, grain, or malt may be ground finer or coarser by turning the notched wheel, and when regulated the key should be again screwed down to prevent the wheel from being improperly turned.

It is only required to set the mill sufficiently close, so as to break or crush every seed or grain. If made to grind too fine, it increases the labour, and the malt does not answer so well for brewing.

The side plates to retain the seed, grain, or malt, in passing from the feeder, can be adjusted if necessary, but care should be taken that they do not touch the rollers.

A very thin plate of tin sweeps the seeds, grain, or malt from the large wheel, and it is kept in its place by a thumb-screw; it should touch the roller about an inch below where the two rollers meet.

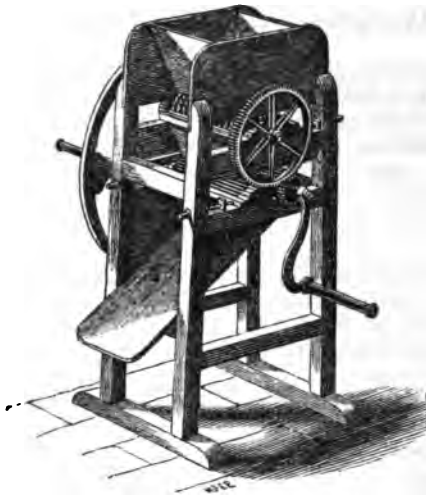
The slip regulates the quantity of seed, grain, or malt to the rollers.

Care should be taken that the grinding rollers clear themselves previously to the mill being stopped, which can either be done by grinding all the seed or grain out of the hopper, or by holding firmly (to prevent its turning) with the hand, the feeding roller. If this is done, the mill always starts easy, and the feed-roller should (if the feed be quite off) be moved with the hand, just sufficient to supply a few grains to set it in motion.

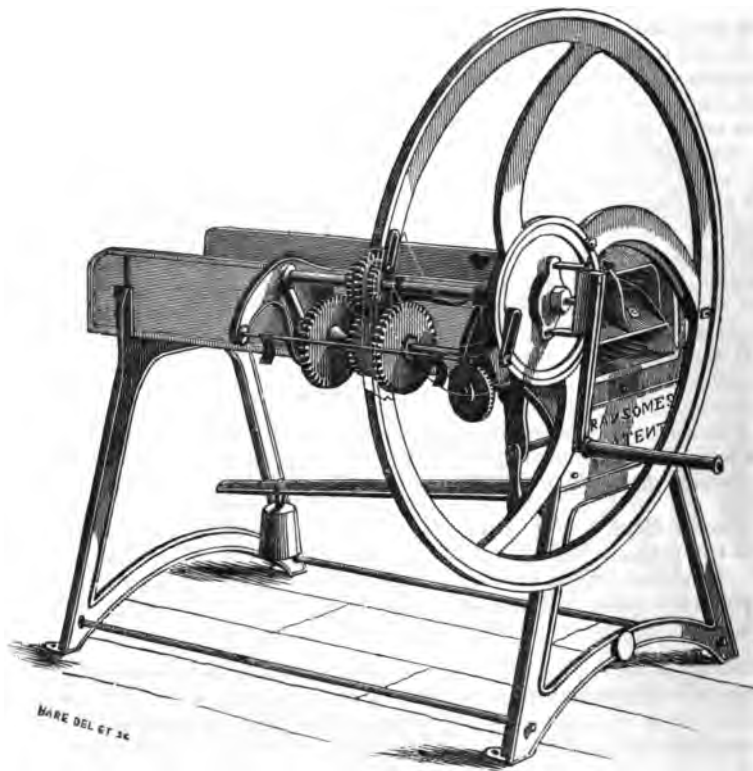
A wire screen should be placed in the hopper to allow the seeds or grain to pass freely through, but to prevent stones or other substances which would do injury to the rollers.

*Garrett's Rape and Linseed Cake-crusher.*—This implement has gained two prizes at the Royal Agricultural Society's Exhibition meetings. It is made with two sets of working barrels for breaking cake into pieces for cattle or sheep, or powder for manure. The barrels are regulated, as may be required, by two pair of screws.

*Ransome and May's Chaff-engine.*—The chaff-engine patented by C. May is a successful attempt at combining the advantages of some of the older plans, with the power of altering the length of the cut, and also avoiding the difficulty of supplying the material to be cut, so evenly that it may be delivered at the mouth pressed so close as to stand against

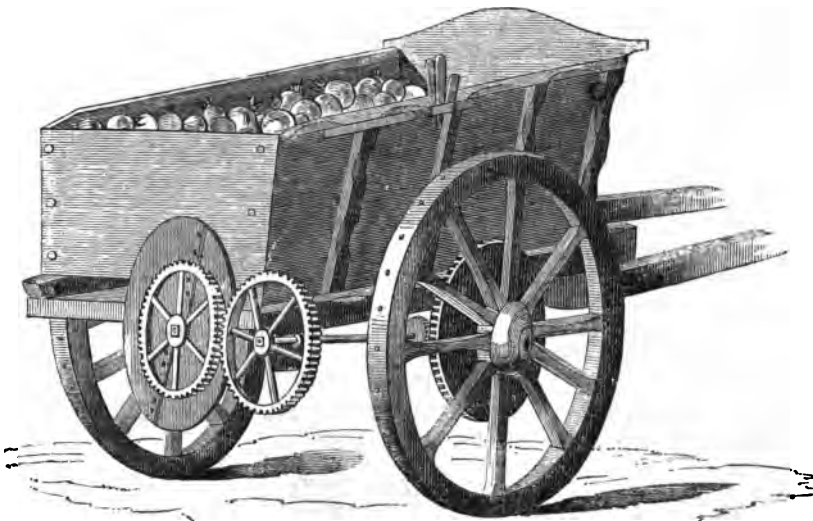


**Garrett's Rape and Linseed Cake-Crusher.**



**Ransome and May's Chaff-Engine.**

the knife. The alteration of the length is accomplished by adding a second shaft, placing the screw which impels the rollers upon one shaft, the wheel carrying the knives upon the other, and connecting the two by toothed wheels of varying diameters, and capable of change at pleasure: this produces a variable rate between the velocity of the rollers and the revolutions of the knife-wheel, and the hay or straw is cut into lengths proportionate to such variation. By means of a plate called the presser, the material is secured close together, and this plate in the patent engine, instead of being fixed to the support of the upper roller, has a motion round the axis of it; and thus, if the feed is thin, the presser follows down, or if thick rises up, so that at all times the proper pressure is applied. The fault of previous engines being, that the proper pressure was ensured only when the feed was uniform; another advantage is also thus gained, inasmuch as no loss of power takes place, for whereas in the old form of engine a feed that was too thick was pressed also too lightly, and a feed too thin not pressed at all, and the work thereby deteriorated,—in this engine a slight pressure is uniformly given, which, while it answers the purpose, opposes but little resistance to the passage of the material. The parts being strongly constructed, a considerable velocity may be given to the wheel carrying the knives, and from 300 to 350 cuts may be made per minute, through an area of from 30 to 50 square inches; 12 cwt. of hay may be cut into half-inch lengths per hour with the power of two horses, and the chaff is so uniform as to require no subsequent sifting. In the *Journal* of 1843 it is said, “Messrs. Ransome’s chaff-machine, which had received valuable improvements (patented by Mr. C. May, one of their firm), by which its durability is increased, the feeding improved, and the cut rendered



Ransome's Turnip-Cutter.

cleaner and more effective, merits high commendation and confidence in its use as the best plain chaff-cutter yet exhibited."

*Turnip-Cutters.*—There is no turnip-cutter peculiarly the invention of this county, except the preceding, which is an ingenious adaptation of the disc turnip-cutter to the turnip-cart. The disc is put in motion by a face-wheel fixed upon the nave of the cart-wheels, which, as it revolves, communicates by means of cog-wheels with the axis of the cutting plate. It offers a very convenient mode of feeding sheep on pastures or lawns, and was introduced about the year 1834 by Arthur Biddell, farmer, of Playford, the inventor of the well-known scarifier which bears his name.

The following are the patents taken out by Suffolk men for improvements in agricultural implements :—

- 18th March, 1785. Ransome, plough-shares.
- 24th Sept. 1803. Ransome, tempering cast-iron shares.
- 30th May, 1808. Ransome, swing-ploughs.
- 1st June, 1816. Ransome, certain improvements in ploughs.
- 28th Nov. 1820. Ransome, plough improved.
- 2nd Nov. 1835. Springall and Ransome, certain parts of ploughs.
- 13th June, 1842. Garrett, R., improvements in horse-hoes, drag-rakes, and drills.
- 7th March, 1833. Springall, corn-stack stand.

#### *Prizes gained by Suffolk Mechanists.*

This account will include a list of the prizes awarded for machines shown by Suffolk mechanists at the meetings of the Royal Agricultural Society of England, with some extracts from the Judges' Reports.

As these meetings are the arena where all the British mechanists contend in friendly competition, they sufficiently show the superiority of the winning implements, and it is therefore needless to give a list of prizes gained at minor shows. The fact that, with the entry of implements so immensely increasing every year, and with every meeting (except one) held at an inconvenient distance from Suffolk, so many prizes have been awarded, shows the excellence of the Suffolk implements.

The entries of Implements at the various meetings were, 1839, at Oxford, 23; 1840, at Cambridge, 36; 1841, Liverpool, 312; 1842, Bristol, 455; 1843, Derby, 508; 1844, Southampton, 948; 1845, Shrewsbury, 942; 1846, Newcastle, 735; 1847, Northampton, 1321; 1848, York, 1508.

#### *Oxford, July, 1839.*

The Report, vol. i. p. lxx., is much too long to copy out. It notices Messrs. Ransome's machines, who sent their waggons with

more than 6 tons of machinery and implements, including Biddell's scarifier and Clarke's universal ridge-plough, together with a great many ploughs, &c.

Mr. Garrett sent a portable threshing-machine, to do from 40 to 50 quarters a day, and some drills.

Mr. Teago of Peasenhall's well-known Suffolk drill was much admired.

*The Awards.*

To Messrs. Ransome, of Ipswich, the Society's gold medal, for their excellent display of implements, and especially their chaff-cutting machines and Biddell's scarifier.

To Mr. John Clarke, Long Sutton, Lincolnshire, the silver medal for his universal ridge-plough.

Amount of premiums at this show—three silver medals, one gold, and 5*l*.

*Cambridge, 1840.*

There were only seven honorary rewards allotted to machines at this show:—

1. To Messrs. Garrett, of Saxmundham, for their corn and turnip drill, with movable axle and swing steerage: 10*l*.
2. To Mr. Wood, of Stowmarket, for his barley-roller.

The judges remarked that

"Messrs. Ransome, of Ipswich, appeared to them to merit the commendation of the Society, as well for their unrivalled collection of machinery of all descriptions as for the superiority which these machines exhibited in the above-noticed particular. A bank of their ploughs, 86 varieties, were arranged and elevated on planks to the height of at least 20 feet, and struck the eye of the beholder as he entered the yard; nor did a nearer inspection of them diminish his admiration.

"There was one other gorse-crusher, manufactured by Messrs. Hurwood and Co., of Ipswich, and to be worked by two men: by this machine the gorse was well bruised, but the labour of the two men was too great to be long sustained, and the quantity produced much less than that by Dell's donkey-machine.

"Of the drills there was a great variety. The Judges commended Messrs. R. Garrett and Son's, which was calculated for sowing either corn or turnips. The improvement effected in this drill seemed to consist in having a movable axle, whereby, when used for sowing turnips on ridges, the wheels may be extended at pleasure, and thus adjusted to the exact width of the ridges. In straw-cutters the Judges regret very much that Ransome's patent chaff-engine, marked A in their catalogue, and for which a patent has recently been taken out, did not fall under their inspection.

"Of iron rollers the Judges distinguished one made by Mr. Wood, of Stowmarket, intended for rolling barley or other spring corn, in which there appeared novelty. The roller was in two parts; the one part

placed a little in advance of the other, so that in turning the movement of each part is reversed, and thereby an actual saving of power is maintained, and a considerable evil obviated incident to rollers in general, which in turning are apt forcibly to displace the soil and disturb the new-sown seed.

"A cake-crusher from the manufactory of Messrs. Bond, Turner, and Hurwood, of Ipswich, was very much noticed. It was made for the purpose of crushing cake by one movement for beast, sheep, and tillage, and this was effected by the introduction of two sieves of different dimensions: the linseed-cake by the action of opposing teeth is crushed into pieces of irregular size; the largest pieces are caught by sieve No. 1, and thrown out by a spout for cattle; that which is next intercepted by sieve No. 2 is of a size suited for sheep; and the remainder which has passed through both sieves may be applied either for tillage or as a mixture with other food."

*Liverpool, 1841.*

Total amount awarded for implements, 253*l.*; and it is from this to 400*l.* in all the succeeding shows.

1. To Messrs. Ransome, of Ipswich, for their two-wheeled plough marked N. L.: five sovereigns.
2. To Messrs. Ransome, of Ipswich, for Biddell's extirpating harrow: 10*l.*
3. Messrs. Garrett and Son, of Leiston Works, Saxmundham, for their drill for general purposes: 10*l.*
4. Mr. James Smyth, of Peasenhall, Suffolk, for his drill for general purposes: 10*l.*
5. To Messrs. Garrett and Son, for their improved horse-hoe: 5*l.*
6. To Messrs. Garrett and Son, for their cake-breaker: 2*l.*

In the Report the judges especially commend Messrs. Ransome's double-lever hand threshing-machine, and their portable disc steam-engine for agricultural purposes.

This disc-engine (invented by Davies, of Birmingham) is described in the Report, as are also Biddell's extirpating harrow, Garrett's horse-hoe, and Biddell's cart turnip-cutter, which was shown by Mr. G. Townley, Hinckley, Leicestershire. Ransome's steam-engine was tried; and Ransome's and Ducie's hand threshing-machines were tried in competition. They were about equal, as four men with Ransome's did twice as much as two with Ducie's.

*Bristol, July, 1842.*

1. To Messrs. Garrett and Son, Leiston Works, for their turnip and manure ridge-drill: 20*l.*
2. To Messrs. Garrett and Son, for their improved horse-hoe: 10*l.*
3. To Messrs. Garrett and Son, for their cake-crusher: 5*l.*
4. To Messrs. Ransome, of Ipswich, for their application of portable and locomotive steam-engines to agricultural purposes: 30*l.*

In the Report the improvements made in Messrs. Garrett's drill since the Liverpool meeting are noticed. Mr. Garrett's horse-hoe commended; his cake-crusher mentioned as "a strong and complete implement, which separates, if wanted, the dust for calves, and breaks the cake large for bullocks and small for sheep, and powders it for manure."

The horse machinery of Messrs. Garrett's threshing-machine was of an improved order, particularly the large iron segmental wheel, so contrived that any one segment can be removed by an attendant, if a tooth is broken. Their bolting-machine, for threshing wheat without breaking the straw, is a valuable implement near large towns.

Messrs. Ransome's steam-engine was on four, instead of two wheels, and the power of the engine applied to move the carriage, instead of horses.

*Derby, July, 1843.*

1. To Messrs. R. Garrett and Son, of Saxmundham, for their drill for general purposes, their own invention: 30*l*.
2. To James Smyth, of Peasenhall, for his nine-coulter corn-drill, particularly adapted for hilly land, his own invention: 5*l*.
3. To Messrs. J. A. and R. Ransome, of Ipswich, for a patent tile and brick machine, the invention of R. Beart, with improvements by A. Stickney: silver medal.
4. To Messrs. R. Garrett and Son, for their improved patent horse-hoe, their own invention: silver medal.
5. To Messrs. Ransome, of Ipswich, for their patent iron-trussed whipple-trees and pomel-trees, their own invention: silver medal.
6. To Messrs. Ransome, of Ipswich, for their general collection of implements and superior workmanship: gold medal.

In the Report, Ransome's iron ploughs, on the truss principle, are described and commended. Garrett's manner of adding wheels to Crosskill's clod-crusher, and his drill with steerage, are described, as are Smyth's drill and Smyth's small hand-barrow for sowing small seeds. Garrett's horse-hoe, and Ransome's horse-engine; Ransome's threshing-machine, which is fed horizontally instead of vertically, and does not break the straw, is commended. A gig-cart, built by Mr. Thomas Dutt, of Bungay, Suffolk, and exhibited by the Rev. Thomas Sewell, near Melton Mowbray, is highly commended both for family use and luggage, for its price, being under duty, and its very superior style of make. Messrs. Ransome's truss whipple-trees are engraved and described.

*Award of Gold Medal.*—In concluding their notice of this immense and splendid show of agricultural machinery, the judges have to record the estimation in which they held the constructive skill and admirable workmanship displayed by Messrs. Ransome,



of Ipswich. The Society's gold medal was awarded to these mechanicians as an acknowledgment justly due to the merit of their valued collection.

*Southampton, July, 1844.*

1. To Messrs. Ransome, of Ipswich, for their plough for heavy land, their own invention : 10*l.* and silver medal.
2. To Messrs. Ransome, for their plough for light land, their own invention : 10*l.* and silver medal.
3. To Messrs. Ransome, for their plough for laying furrows all in one direction, invented by Henry Lowcock, of Marldon, Devon : 5*l.*
4. To Richard Garrett, of Saxmundham, for his drill for general purposes, his own invention : 20*l.* and silver medal.
5. To James Smyth, of Peasenhall, for his manure and seed drill, for ridge or broad work, his own invention : 10*l.* and silver medal.
6. To Richard Garrett, for his horse-hoe for general purposes :  $\frac{1}{2}$  silver medal.
7. To Messrs. Ransome, for their set of horse-works for driving several mills or machines, combined or separately, their own invention : 30*l.*
8. To Messrs. Ransome, for their hand or horse drain-tile and pipe machine, invented by F. W. Etheredge, of 11, Furnival's Inn, London : 20*l.* and silver medal.
9. To Richard Garrett, for his wrought-iron stack-stand, invented by J. Springall, of Ipswich : silver medal.

The prize-plough for both light and heavy soil was the same—a larger and differently curved mould-board being used on heavy soil. Lowcock's plough is described, as are Springall's stack-stand and Etheridge's tile-machine. Ransome's corn and seed-crusher is highly commended, as is Ransome's horse-engine and machinery. The judges state that the action of Garrett's horse-hoe is "perfect;" and Ransome's chaff-cutters "never-failing workers, with a few improvements."

*Shrewsbury, July, 1845.*

Nothing was shown from Suffolk in the implement line.

*Newcastle-on-Tyne, July, 1846.*

1. Richard Garrett and Son, of Leiston Works, Saxmundham, for their bolting threshing-machine : 25*l.*
2. Richard Garrett and Son, for their tile and pipe machine, invented by Richard Weller, of Capel, near Dorking, Surrey : 5*l.*
3. Richard Garrett and Son, for their Kent drill : silver medal.

In the judges' Report, Weller's pipe-machine, which will turn out very large objects, and Garrett's Kent drill, are described; and Garrett's horse-hoe commended.

*Northampton, July, 1847.*

(73 drills entered into competition.)

1. Messrs. Garrett, Saxmundham, for the best drill for general purposes: 15*l*.
2. Messrs. Garrett, for the best turnip-drill on the flat: 10*l*.
3. Messrs. Garrett, for the best turnip-drill on the ridge: 10*l*.
4. Messrs. Garrett, for the best threshing-machine (bolting): 20*l*.  
(47 competing machines).

Miscellaneous:—

5. Mr. Smyth, Peasenhall, for the best clover-seed and rye-grass barrow: silver medal.
6. Messrs. Garrett, for the best horse-hoe: silver medal.
7. Biddell's scarifier, exhibited by Messrs. Sharman: 10*l*.

In the judges' Report it is stated that the best heavy-land plough (on such land that several ploughs broke) was decidedly the old Y. L. plough of Ransome, with an improved mould-board invented by the exhibitor, Mr. Busby, of Newton-le-Willows, Yorkshire. It worked well in the tenacious land 8 inches deep, and would do 12 inches with ease. It gained the prize of 10*l*.

In scarifiers, Biddell's seven-tined implement, manufactured by Ransome and May, did much the best; Ducie's second: a prize of 10*l*. was therefore awarded to Messrs. Sharman and Co., Wellingborough, the exhibitors. This scarifier, with shifting tines, covered 4 feet 8 inches.

Messrs. Garrett's horse-hoe was noticed: it had been awarded four prizes at the meetings of the Royal Agricultural Society before. Messrs. Garrett's drills, including the Kent drill, mentioned.

Mr. Bond's linseed-crusher, exhibited by Mr. Sharman, would have obtained the prize but for its feeding part being inferior. In the trial of various machines, all worked by two men, Bond's did a gallon in a minute, and well; Ransome's, a gallon in 2 minutes; Nicholson's, in 4·10 minutes; Garrett's, in 4; Stratton's, in 2½; and Ferrabee's, which won the prize, in 1½ minutes, and beautifully.

*York, July, 1848.*

1. Garrett's patent bolting threshing-machine (47 competitors): 20*l*.  
[This was the third prize this machine has gained at the Royal Agricultural Society's meetings.]
2. Garrett's drill for turnips and manure on the flat: 10*l*.  
[This has also gained three prizes at the Society's meetings.]
3. Garrett's horse-hoe on the flat: silver medal.  
[This makes the sixth prize.]

4. Bond and Hurwood's linseed-crusher (shown by Messrs. Sharman) : silver medal.
5. Biddell's wrought-iron scarifier, manufactured by Messrs. Ransome and May, exhibited by Messrs. Sharman : 10*l*.

*Note.*—Attached to their threshing-machine was a new invention of Messrs. Garrett for shaking the straw, so that all loose kernels, leaf, or loose rubbish are thoroughly separated from the straw. This addition occupies a very small space more than the machine, independent of a shaker, and is so complete and perfect in its mechanism that it requires very little driving power. It is said to do the straw-shaking thoroughly for not more than one man's power off the machinery. Messrs. Sharman obtained a medal for a linseed and corn-crushing machine, invented by Messrs. Bond, of Ipswich, and improved and manufactured by W. P. Stanley, of Peterborough. This is a similar implement to the one exhibited last year at Northampton, which, according to the report of the judges, did its work in 75 per cent. less time than any other. The apparatus for feeding and varying the distances of the rollers, to suit different kinds of seed, has been simplified and improved. Two men can crush one bushel of linseed in ten or twelve minutes, effectually breaking every seed. It can be profitably and easily applied to horse-power. Price 11*l*. 11*s*.

Busby again obtained the first prize for the heavy-land plough. This has Ransome's truss, beam, &c.

#### *V.—The Farmers' Clubs, with their Discussions.*

I SHALL treat this subject in a general rather than in a particular manner. That is, as the rules of these farmers' clubs are essentially the same, I shall give those of one of the principal, or of the one first founded, omitting any minor differences in the details.

The discussions of the Suffolk Farmers' Clubs are printed in the 'Farmers' Magazine' and other publications. I shall, therefore, not pretend to give an account of all the subjects that have been discussed (which, indeed, would be impossible), but only a few, just to show the manner in which these discussions are carried on, and as a sample of the rest. These few I shall choose on subjects relating more particularly to the county, and such as will point out the opinion of the members upon important agricultural subjects of more general interest.

*Agricultural Associations.*—I shall take the West Suffolk Association as an example of the others, for although the other Societies differ in minor matters, and the West Suffolk itself has been altered since its establishment in the points of only one meeting being held in the year, viz, September, and that both the

ploughings\* and sheep-shearings are discontinued for want of funds, yet my object is rather to give the general rules and to show how useful these Societies have been and may be, rather than to give a detailed account of each one, as the rules and regulations are constantly altering, and even many of the Societies themselves.

The West Suffolk Association was established in 1833, and comprises the nine hundreds of Babergh, Blackbourn, Cosford, Hartismere, Lackford, Risbridge, Stow, Thedwastre, and Thingoe. It rewards three classes:—1. Industry and skill. 2. Cultivation. 3. Stock. Class 1 being open to all persons residing within the district and recommended by a member, and 2 and 3 to members only. The subscription is any sum not less than 1*l.* paid beforehand. Three meetings shall be held annually at Bury St. Edmunds: the first in May, for awarding prizes for sheep-shearing; the second in the last Friday in September; and the third, for fat stock only and roots, on the first or second Tuesday in December. The judges of stock shall, in deciding, have regard to the symmetry, size, early maturity, and qualities characteristic of the different breeds, making due allowance for age. The committee shall have the right of withholding the whole or any part of a prize in all cases which shall appear to the judges of insufficient merit; but when deserved, the prize shall be given, though there be but one candidate. Any doubts or disputes as to adjudication of prizes, &c., shall be finally decided by the committee, and all cases of *wilful* imposition shall occasion a forfeiture of prizes, and a disqualification as a member or a candidate for any future prizes. The committee to be chosen yearly by the members, and to consist of 24 members, exclusive of the president and vice-president.

#### PRIZES.

##### *Class 1.*

*Sheepshearing*—the meeting held in May.

Conditions—Each candidate to shear 4 hoggetts, viz., 2 Southdowns and 2 half-breeds, between the hours of ten and one.

Prizes—Best sheepshearer, 2*l.*; second, 1*l.* 10*s.*; third, 1*l.*; fourth, 15*s.*; fifth, 10*s.* Each of the five best of unsuccessful, 5*s.*; ditto next five ditto, 2*s.* 6*d.*; remainder of the candidates, 1*s.*

Industry and skill—Meeting on the last Friday in September.

*Labourers*.—To the labourer in husbandry, whose rent or whose property in house or land does not exceed 5*l.* a year, by whom the greatest number of legitimate children has been brought up, without or with the least parochial relief, in each hundred, one prize of 2*l.*

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\* The General Bury Ploughing-Match is in existence, but not, it seems, the District.

each : and three remaining at the disposal of the committee, to apply to labourers and servants generally.

To the labourer in husbandry who has worked or served the longest time in the same farm, or with the same master or mistress, and has during that time been distinguished for sobriety and regularity of conduct, one prize of 2*l.* in each hundred.

*Servants.*—To the male yearly or weekly servant or horse-driver, who has worked or served the longest time on the same farm, or with the same master or mistress, and has during that time been distinguished for sobriety and regularity of conduct, one prize of 2*l.* in each hundred.

To the female dairy servant who has worked or served the longest time on the same farm, or with the same master or mistress, one prize of 2*l.* in each hundred.

*Shepherds.*—1. To the shepherd who shall have reared, from not fewer than 400 ewes put to the tup, the greatest number of lambs, with the smallest loss of ewes, up to the 1st day of June, 3*l.* ; to the second best, 2*l.*

2. To the shepherd who shall have reared, from not fewer than 200 ewes put to the tup, the greatest number of lambs with the smallest loss of ewes, up to the 1st day of June, 2*l.*

N.B. One lost ewe is calculated as a lamb and a half.

To the shepherd who shall produce the best testimonials of length of servitude upon the same occupation, or with the same master or mistress, combined with skilful management, 2*l.*

*Ploughing.*—Best ploughman above 20 years of age in each district, one prize of 1*l.* ; second ditto, 10*s.* Best ploughman under 20, 10*s.* ; second, 7*s.* 6*d.* The hundreds to be divided into districts not exceeding 3 in each hundred.

The prize ploughmen to contend for a reward at the Autumnal Meeting of the Association at Bury, when a prize of 2*l.* will be given to the best, and 1*l.* to the second-best ; and 1*l.* to the best, and 10*s.* to the second-best, under 20 years of age ; and 2*s.* 6*d.* to each of the other candidates. Quantity of land ploughed by each candidate not less than a quarter of an acre.

*Allotment prize.*—A prize of 10*s.* for field and cottage gardens of not less than 20 rods each, nor more than half an acre, to labourers in those parishes where a member of the Association resides.

NOTE.—Application to be made to two of the principal occupiers in the parish or parishes adjoining, to act as judges for this prize, with power to call in a third as umpire, if necessary, and to report their certificates to the Committee of Management.

#### *Class 2.*

*Cultivation.*—To the tenant who shall have expended the largest sum in spade-draining within the last 12 months, relatively to the extent of wet land in his occupation, 4*l.*

To the tenant who shall have carried and spread the greatest number of chaldron loads of clay, loam, or marsh earth, within the last 12

months, according to the relative proportion of light land in his occupation, 4*l*.

*Stock.*—The prizes for stock are for the best and second-best Suffolk stallion, best and second-best Suffolk mare, best 2-year-old Suffolk gelding, best riding gelding or filly; best Suffolk bull, ditto of any other breed; best Suffolk cow, ditto of any other breed; best and second-best lot of neat stock; best shearling Southdown tup, ditto of any age; best shearling tup of any other breed, ditto of any age; best pen of 5 Southdown shearling ewes, ditto of any other breed; ditto of Southdown breed, *fed on hay and green food only*; best boar, bred in Suffolk; best breeding sow, bred in Suffolk.

The prizes for fat stock exhibited in the first or second Tuesday in December—best and second-best fat ox, best and second-best fat heifer; best and second-best pen of 5 fat Southdown shearling wethers, best and second-best ditto of any other age; best and second-best fat hog.

In roots, 10*s*. and 5*s*. are respectively given for the 10 best and second-best Swedish turnips, white turnips, mangold-wurzel, cabbages, and carrots.

It is a favourite subject with some metropolitan papers to sneer at these Associations and compare the amount of prizes awarded to stock—that is, as it were, divided among the farmers themselves—and that awarded to the poor for skill or long service. It is a favourite comparison with them to compare a fat hog and the prize awarded to it with a starving labourer, and to pretend that these prizes are awarded as a *payment* for long service or skill. Now the fact is that neither the masters nor men look on them in this light. These writers, who, by-the-by, are generally ignorant of rural affairs, might as well call the soldier's Waterloo and the sailor's Trafalgar medals payments for wounds and long service, and sneer at their receiving a paltry medal, worth, perhaps, 2*s*. 6*d*. What these medals are to the soldier or sailor, the framed and glazed certificate is to the aged labourer, who looks upon it with a similar pride as a sign of the good opinion and respect of his superiors. Nor is the 2*l*. a sum at all to be despised by a poor man, whatever it may be to the editor of a paper. A great outcry has been raised against prize-beasts being overfatted, and, as far as *tenant* farmers and *county* shows are concerned, on no ground whatever; and if it has occurred at our large shows, still the same outcry might just as well have been in the case of overgrown horticultural articles and flower-shows. The case is the same; it was never pretended that these very fat beasts paid individually, but no more do the prize flowers and vegetables: but recollect, in both cases, where things but moderately good are thought worthy of competing for and obtaining prizes, those in common use will be found most decidedly bad. In both cases it is to show the perfection they can be brought to, by comparison which kinds will prove most profitable in common use, and to excite as

near an approach to them as profit will admit. Would the man who complains of over-fat prize bullocks prefer always consuming such tough, lean, half-fatted meat as he would meet with in many foreign countries? Fault-finders must certainly have come to a fine pass when they can find nothing to carp at, but that the farmer gives prizes to his agricultural labourers, and makes his meat too fat. But is it too fat?—perhaps so for sedentary towns-people and weak dyspeptic stomachs, but there is never any too fat for hardworking labourers or persons taking a proper quantity of out-door exercise. The fat is of far more use than to go for “cook’s perquisites;”—in frying, pie-crusts, and in the making scores of savoury dishes, as “dripping,” which is used by the poor in all respects as butter, and the suet for suet dumplings or the Christmas plum-pudding—for recollect, there is no suet except the beasts are beyond moderate fatness. It is the last part of the fattening process that generally pays, when the animal eats little, rests much, and lays on fat quickly.

In the Society I am speaking of (the West Suffolk, and other Suffolk Societies much resembling it), neither the individual nor the collective amount awarded to stock can be invidiously compared to those of skill or long servitude. There is only one prize for stock above 5*l.*, and the relative amount, as gathered from the rules and regulations, would be as follows:—

| <i>Working Classes.</i>   |  | £.  | s. | d. |
|---|--|-----|----|----|
| Sheep-shearing—say 15 prizes . . . . .  |  | 7   | 12 | 6  |
| Labourers—21 prizes of 2 <i>l.</i> each . . . . .   |  | 42  | 0  | 0  |
| Servants—18 prizes of 2 <i>l.</i> each . . . . .  |  | 36  | 0  | 0  |
| Shepherds—4 prizes . . . . .  |  | 9   | 0  | 0  |
| Allotments—varies.  |  |     |    |    |
| Ploughing district prizes—4 in each district, say }<br>2 districts in a hundred . . . . . |  | 42  | 15 | 0  |
| Ploughing at Bury—4 prizes and various half-crowns  |  | 5   | 0  | 0  |
| All of which may (or rather might formerly) be<br>claimed by proper competitors.          |  |     |    |    |
|   |  | 142 | 7  | 6  |
| <i>Employers.</i>   |  |     |    |    |
| Cultivation—2 prizes . . . . .  |  | 8   | 0  | 0  |
| Stock at the September Show—21 prizes . . . . .   |  | 87  | 0  | 0  |
| Stock at the December Show—10 prizes . . . . .  |  | 29  | 0  | 0  |
| Roots—10 prizes . . . . .   |  | 3   | 15 | 0  |
|   |  | 127 | 15 | 0  |

Let us take two years at random as an average, and although, from a deficiency of competition, the sums awarded do not equal this amount, yet we shall find that the sum awarded by masters to themselves does not greatly preponderate over that awarded to men. Thus, 1837—labourers, 30*l.*; shepherds, 7*l.*; allotments,

3*l.*; ploughmen, 21*l.* 10*s.* = 61*l.* 10*s.* Cultivation, 8*l.*; September stock, 67*l.*; fat stock, 17*l.* = 92*l.* 1840—sheep-shearers, 7*l.* 17*s.*; labourers, 40*l.*; allotments, 2*l.*; shepherds, 9*l.*; ploughmen, 20*l.* = 78*l.* 17*s.* Cultivation, 8*l.*; September stock, 76*l.*; fat stock, 19*l.* = 103*l.* The West Suffolk Association extends (so far as regards the exhibition of stock) over the counties of Suffolk, Norfolk, Essex, and Cambridge. Mr. George Beeton is secretary.

The other Societies are—

The East Suffolk Association, established 1831; Mr. Manning Keer, secretary. Place of meeting varies; Framlingham, Saxmundham, &c.

The Central Suffolk, established 1840; meetings held at Stowmarket; Mr. Edward Archer, secretary.

The South Norfolk and North Suffolk was established 1838; meetings held at Eye; Mr. H. Cave, honorary secretary.

The South Suffolk Society was established in 1835, and has been defunct some years. A Society is now (1848) being originated to take its place, to be called the Sudbury Agricultural Association; president, N. C. Barnardiston, Esq., Ryces Lodge; honorary secretary, Rev. Edwin Sidney, rector of Great Cornard. This Society already numbers more than 60 members.

There was formerly an East Suffolk Society for protection purposes (secretary, W. Bloss, Esq.), which is, I believe, not now in existence.

*Farmers' Clubs.*

The Farmers' Clubs of Suffolk consist of—

1. Ipswich and Ashbocking; Mr. B. B. Farrow, of Ipswich, Secretary. This *united* club was established March 31st, 1840.
2. Beccles, established 1839; C. Gibson, Esq., of Willingham Hall, Hon. Sec.
3. Debenham, established 1840; W. Green, Hon. Sec.
4. Framlingham, established 17th Feb., 1840; Mr. W. D. Freeman, Sec.
5. Hadleigh, in the first instance established 2nd Dec., 1839, and the Agricultural Association added to it 13th Feb., 1846; Mr. F. C. Grimwade, Sec.
6. Halesworth, established 27th March, 1839; Mr. C. Lenny, Sec.
7. Needham Market, founded 23rd Feb, 1839; Mr. Fred. Hayward, Sec.
8. Sudbury is now entirely broken up.
9. Wickham Market, established 1839; Mr. J. P. Barclay, Sec.
10. Wrentham, established 1839.
11. Woodbridge was established 12th Feb, 1840, but is now broken up.
12. Yoxford was established in the summer of 1837; a short time after the Ashbocking, by (as Mr. Poppy informs me) J. Allan Ran-



some, Esq. It was the Second society of the kind in England. R. Hughman, Esq., is Secretary.

As the Ashbocking Club was the first established in England, and the one from which all the others took their rules, I shall give the rules and regulations only of this club, and shall add the report of the first annual meeting from 'The Essex and Suffolk Times' of April, 1838. Mr. J. D. Everitt, of Cox Lane, Ipswich, who was, I believe, the founder of this club, has kindly forwarded me this information.

The Ashbocking Club was established in the first instance in the early part of 1837, and remodelled as the Ipswich and Ashbocking, March 31, 1840.

It was established for the purpose of advancing the science of agriculture by discussions on subjects relating to its practice, the purchase of publications useful to its members, and the occasional exhibition of agricultural produce.

*Rules.*—"I. That the officers of the club shall consist of a chairman and a vice-chairman, a secretary and assistant secretary, a treasurer, and a committee of six persons, all of whom shall be elected annually at the general meeting. The chairman, vice-chairman, secretary, assistant secretary, and treasurer to be members of the committee, *ex officio*.

"II. That every member of the club shall pay an annual subscription of five shillings; the subscription to be paid in advance, and to become annually due, hereafter, at the general meeting in November.

"III. That any person desirous of becoming a member, shall be proposed and seconded at the meeting preceding that on which his election takes place; and on his being elected, he shall be considered a subscriber, until notice to the contrary be given by him previous to the annual meeting.

"IV. That individuals not being members, may have the opportunity of attending one meeting in each year, through the introduction of a member; that no member shall be allowed to introduce more than one friend on each evening, but that the chairman shall have power to introduce any individual as often as he may think desirable—such party to be allowed to take part in the discussion, but not to vote. The member introducing a friend is requested to see that the name of the visitor, together with his own, be entered in a book kept for that purpose.

"V. That no question of a political tendency, or which shall refer to any matter to be brought forward or pending in either of the houses of parliament, shall be discussed at any of the meetings of this club.

"VI. That no monthly meetings shall be competent to decide or finally to settle any question that has not been noticed for consideration at a previous meeting; but any subject not excluded by the rules of the club may, with the chairman's approval, be discussed.

"VII. That the first meeting in November shall be the general annual meeting; at which officers shall be chosen, and the committee present their report, and the treasurer produce his accounts.

"VIII. That on the requisition of thirty members, a general meeting for any special purpose shall at any time be called by the chairman, who shall state in a circular, addressed to each member of the club, the purpose for which such meeting is called; and such general meeting shall have power to decide upon any question so advertised, and no other.

"IX. That all questions upon which it may be necessary to come to a division, shall be decided by a majority of votes, upon a show of hands, the chairman to have the casting vote in addition to his own.

"X. That the meetings (with the exception of one to be held annually at Ashbocking) shall for the present be held in the Lecture-room of the Mechanics' Institution, to commence at five o'clock in the evening during the winter months, and at six o'clock in the evening during the summer. A list of days for meeting to be prepared by the committee, and placed in the hands of each member.

"XI. That the amount expended in the purchase of books shall not exceed the funds of the club; excepting by a private arrangement among the members, for which arrangement the parties making it shall be responsible.

"XII. That any member wishing to effect an alteration in or addition to the rules of the club, shall give notice in writing of his intention to the secretary, at some monthly meeting; that the alteration or addition shall be discussed at the next monthly meeting, and that all the members shall be specially summoned on the occasion."

*Rules for the Circulation of Books.*

"I. That the member who first applies for any book shall have the first claim to it.

"II. That any member wishing for a work already taken by another, shall signify the same to the librarian, who shall enter his name as the next applicant; and priority of application shall give priority of claim.

"III. That no work shall be retained by any member longer than from one monthly meeting to another; and that in failure of its being produced to the librarian at the expiration of that term, one shilling forfeit shall be levied on the retainer of the same, which shall entitle him to hold it three days longer, with the fine of an additional sixpence per diem, for every day after that period.

"IV. That no member shall renew any book till it has lain in the library two days.

"V. That any member whose name stands as the proposer of a subject for the succeeding meeting, shall be entitled to take precedence of every other member, for the perusal of any work having immediate reference to the subject to be proposed by him."

There may be a few variations from these rules in other clubs. Thus the subscription to the Woodbridge was only 4s., and in some instances the farmers' club and agricultural association are united. At Hadleigh the subscription is any sum not less

than 10s., and for this the members have the monthly discussions and library of a farmers' club, together with an annual meeting in May, where prizes are awarded for long servitude, greatest number of legitimate children without parish relief, to the labourer or female *who shall have subscribed the greatest number of years to an enrolled benefit society*, to shepherds, sheepshearers, ploughmen, and for stock.

*" Report of the First Annual Meeting of the Ashbocking Farmers' Club.*

" At the First Annual Meeting of the Ashbocking Farmers' Club, held on Thursday, April 5, 1838, the following Report was read:—

" It is now twelve months since we first met in this place for the purpose of forming the farmers' club. The experiment was altogether new, and in some respects not very encouraging. In a neighbourhood like this, remote from many of those small towns which are so numerous in certain districts of our county, it would have been unreasonable to expect that a very large number of persons interested in our proceedings could be collected with any regularity; and not more reasonable would it have been to have anticipated, in the discussion of such questions as might come before us, that regularity and elegance which would be displayed by a body of men possessing high scientific attainments. Laying claim to no such pretensions as these, and forming but moderate expectations as to the probable number of our party, we nevertheless felt desirous of trying whether we might not a few of us meet together, and in a free and easy manner talk over such questions as are of importance to the farmer, either in the management of his land and crops, or in the relation in which he is placed to the other classes of society; thereby informing our minds, and creating and cherishing a mutual feeling of good will. So much at least we thought ourselves warranted in expecting, but our hopes did not terminate here. We looked to the possibility of other parishes following our example, and were not entirely without hope that club after club might be formed in the surrounding districts, until the whole county should be put into such a state of organization as would afford every facility for friendly and useful intercourse; and if thus much were accomplished, we could not help asking ourselves, why may not the whole farming population of the United Kingdom be ultimately united by the operation of this system, in such a manner as shall enable them to give that clear and forcible expression of their sentiments which is so frequently required in the present state of our affairs. We have sometimes been ready to reproach ourselves with folly when we have indulged such sanguine thoughts; and when we have ventured to give expression to them we have sometimes met with the ridicule of others. But the object was important, and the way was open, and we well knew that if nothing were attempted nothing would be done. Preferring also the disappointment of a failure to the self-reproach we should have endured if we had wanted courage sufficient for so easy an enterprise, we ventured on the attempt, and at present feel no disposition to regret the time and attention we have given to it.

"The exhibition of articles of agricultural produce last autumn far exceeded anything that could have been expected. The interest excited by it was considerable, and it was the occasion of many varieties of vegetables, herbaceous plants, and grains being distributed into several different parishes, where the great variety of soils and different modes of culture will necessarily conduce to increasingly satisfactory results.

"In common with our neighbours we felt it ~~was~~ a degradation to be compelled to insert our names, &c. in two-inch letters upon our taxed carts; we therefore united our voices with those who petitioned for the repeal of that obnoxious and invidious clause, and it is satisfactory to us that we did not petition in vain. Petitions for the repeal of the malt tax were prepared previous to the determination of Government to try Captain Rudkin's machine, but in consequence of that determination we have thought it better to defer petitioning until the result of the trial has been made known.

"In further proof of the utility of the farmers' club we may refer to two local benefits, which, though not permanently connected with the club, are indebted to it for their existence, viz., the establishment of a road leading from Ipswich to Otley and Helmingham, and the arrangement of a plan of an association for prosecuting felons, on a principle more equitable and less expensive than that usually adopted.

"We feel much encouraged by the establishment of several clubs after the model of our own, and we congratulate those spirited individuals who exerted themselves in their formation on the success they have already obtained. Yoxford and Harleston bid fair to place farmers' clubs in a highly respectable position, and we trust that Eye and Beccles will compete with them in a praiseworthy emulation."

After the adoption of the Report several resolutions were passed in furtherance of the objects of the Club, from which we extract the two following:—

"1. That the thanks of the club are due to those gentlemen (not being members) who furnished specimens of roots, seeds, and other productions to the exhibition last autumn.

"2. That a show of agricultural produce for the present year take place on the 1st of November next.

"After the business of the evening had been disposed of, the members, as usual, spent half an hour in the most social manner, and broke up at about half-past nine."

The establishment of five agricultural societies and ten farmers' clubs in a county where but one existed in 1804, is a proof of the increased intelligence of the age and the improvement in the farming of the county. Arthur Young thus mentions the Society referred to in his Report:—"The only agricultural society ever established in Suffolk is the present existing one, called the Melford Society, which now meets alternately at Bury and Melford. At first some of the members, according to the design of the institution, read memoirs of experiments, which appeared in the

'Annals of Agriculture,' but for some years this has been discontinued. A few premiums were offered, but never claimed, and these have consequently been also discontinued. Were an effective county society instituted, to meet three times a year at Bury, twice at the assizes, and once at the time of Bury fair, when there is a considerable assemblage from every part of the county, with local committees at the chief towns, they might be able to do some good, provided their premiums were few and considerable, and aimed at such objects peculiarly adapted to the agriculture and live stock of the district.

#### *Discussions of the Farmers' Clubs.*

In making a selection from the discussions of our farmers' clubs I shall confine myself to those subjects that refer more especially to the practice of the county; at the same time this selection will show the opinions of the Suffolk farmers of the present day upon some of the most important operations of farming.

#### *"Beccles Farmers' Club."*

"The Beccles Farmers' Club, in their first Report (1840), discussed the most economic and best means of cutting wheat—the most effectual means of destroying the black caterpillar—subsoil ploughing—the best steeps for grain, &c.; the best method of keeping cart-horses was also discussed. In this the method of feeding with cut chaff was strongly recommended. For economy's sake a small quantity of straw might be mixed with the hay for cutting, and during the winter months bean-stalks might be given. However, an increased quantity of corn would then be necessary. Some members stated, that when the allowance of hay or clover was stinted it would be found better to grind the corn, by which means the chaff would be better consumed than when the corn was given whole. The club resolved, that it is the opinion of this meeting, that the most approved method of keeping cart-horses is to allow them each 12 stone of hay per week and 1 bushel of oats, or an equivalent of bean, meal, and pollard, as winter keep; a small quantity of straw cut into chaff is considered advantageous in point of economy. Through the summer it is desirable to feed them upon tares or other green meat in yards, in preference to turning them out on the pastures. And also that yards with hovels for feeding and lodging are preferable to confinement in the stable either winter or summer.

"At the last meeting the subject under discussion was Mr. Stace's 'Prize Essay on the Rotation of Crops for Heavy Lands.' The rotation therein recommended was a continual course of cropping; this at first appeared so extraordinary that it was thought impracticable, but upon more mature consideration the objections were not so great, and it was argued by some members that the rotation might be pursued upon what we here call good deep heavy lands, though upon the generality of wet soils it was agreed as not being desirable to depart from the long established course, viz., fallow or turnips, barley the following spring, then

clover or beans, followed by wheat. This has been the system for many years in both Suffolk and Norfolk upon wet heavy lands, though of late a proportion of tares has been grown upon the wheat stubbles—some part for soiling with horses in the summer, and the remainder fed off with sheep, the land being then broken up and fallowed for barley. It has, however, been found that such tare land is not kind for clover; it is therefore usual to grow the tares upon that proportion of the quarter intended for beans, after the barley crop is removed.”—C. GIBSON, *Agricultural Gazette*, April 20, 1844.

From the Fifth Annual Report of the Beccles Farmers' Club I also extract the following:—

“ At the closing meeting of last year, after a discussion on the question of ‘ *Corn Rents*,’ a resolution was passed, declaring such a system preferable to a fixed money payment.

“ ‘ *The Improvement of Agricultural Implements and Machinery*’ was the subject of the November meeting; and taking each implement in detail, and first of ploughs. A foot plough with two wheels, introduced by Messrs. Ransome, appears to be the one most in repute, from its capability of breaking up hard land, and its steadiness in work. In the formation of harrows it was considered of great importance that the point of draught should be so fixed as to prevent the teeth tracking each other when in work. Biddell’s scarifier was considered well adapted for breaking up land in a dry state, and frequently superseding the use of the plough in working wheat stubbles immediately after harvest. The horse-hoe was thought of great service on a farm; the one lately invented by Mr. Garrett received general commendation. Smyth’s and Garrett’s lever corn-drills were much approved. An objection was made to the drop-drill from its depositing manure in large quantities; a fermentation took place that injured the seed, and sometimes destroyed it; it was, therefore, contended, that the system of distributing the manure regularly in the ridge was preferable. Some observations were made upon threshing machines, and defects noticed as compared with those used in Scotland.”

It was also recommended:—“ That all Agricultural Societies should endeavour to have a trial of implements, in order that the comparative advantage of each might be fairly tested.”

“ ‘ *The application of Clay*’ was discussed at the next meeting. Clay is applied to newly broken-up land at the rate of 45 chaldrons per acre; was considered essentially necessary, although this quantity in two applications was to be preferred. Upon light sandy soils the process tends to increase their solidity, and render them more retentive of moisture; but as regards its application to heavy lands, it would not be found beneficial.”

‘ *Raising and preserving Thorn Fences*’ engaged the attention of the Club, and the following are the heads of the resolution they came to on the subject:—

“ To thoroughly clean the land; and if an old fence has been thrown down, it is imperative to remove all the old bank, and replace the same with new earth. That the ditch ought to be 4 feet wide at top, and 3 feet

deep, sloping the same so as to leave it 1 foot wide at the bottom. That the table or bed for the spring should be made with the second spit, the table to be not less than 14 inches deep, and laid back 12 inches in the slope. The spring to be placed in a trench with the roots at least 2 inches the lowest, and then covered with mould: a hedge of bushes to be put upon the bank. That it is desirable to plant the largest spring that can be procured, and not less than 50 plants in a rod of  $5\frac{1}{2}$  yards.

"That in the after-management of fences great care should be taken in keeping them clean; and it is requisite to cut the spring off at the end of three or four years, should the same be found in a stunted state, scouring out the ditch, and laying fresh earth upon the spring. That buck-heading is not desirable oftener than every alternate time of cutting, and that such cuttings may be done every eight years. It will be found beneficial to keep the ditches clean, by plashing them every year, so as to prevent any rubbish growing therein. That clipping fences, and keeping them at all times at a certain height, is beneficial to the adjoining crops, and has a neat appearance.

"The last subject for the year was '*Subsoil Ploughing*.' It was admitted that subsoiling heavy land immediately after being well drained greatly assisted the escape of the water into the drains, and increased the firmness of the soil; but in no instance had it been found to produce the least influence upon the crops. The effect upon light soils was equally unsatisfactory, no advantage being produced beyond a slight improvement in the ploughing. This being the unanimous opinion of the members present who had practised it, a resolution to that effect was agreed to."

#### *Beccles Farmers' Club, 1847.*

The first monthly question was, "The relative value of tares and turnips as fallow crops upon heavy soils." The resolution come to was, "That tares as a fallow-crop are more advantageous than turnips; but that such a crop should not be grown upon the same land more frequently than once in twelve years."

2nd. "What assistance has science given to agriculture?" The resolution come to was, "That in reference to science in general, chemistry and mechanics have given the greatest assistance to agriculture."

3rd. "The relative usefulness of waggons and carts as machines of carriage." A slight majority sanctioned the following resolution: "That carts are to be preferred to waggons on account of their less cost, greater convenience, and requiring less horse-labour."

4th. "The allotment system, more particularly in regard to its effects upon the social and moral condition of the labourer." Resolution, "That cottage allotment should not exceed 40 rods of land to each person, which should be situated near the residence of the labourer; that under this system they have a strong tendency to strengthen the industrial habits, increase the physical resources, and to raise the moral and social condition of the labourer."

5th. "The best method of lodging beasts during the process of fattening." No definite resolution was come to; loose boxes appeared to be preferred.

6th. "The best management of the wheat crop, in relation to top-

dressing, hoeing, feeding with sheep, &c." The experience of the members present was rather unfavourable to top-dressing the wheat crop. They had applied rape-cake, nitrate of soda, and other artificials, with very uncertain results. A few instances were mentioned in which the application of nitrate of soda had been successful, but the practice was not strongly recommended. Hoeing was advised in the early stage of its spring growth, and also harrowing when the land is surface-bound. Folding with sheep was approved of on rich soils with a thin plant, the folding to take place early in the spring.

7th. "The respective uses of the hand and horse-hoe." A preference was given to the horse-hoe in all cases where the distance between the rows is sufficient to allow the hoes to pass freely, more particularly for the bean and root crops. That it allows the labour to be performed earlier, at a greater depth, and more quickly (a very important consideration in a wet time), with less treading of the land, than by the hand-hoe; the use of which is to be considered only as a secondary and assistant character. It was remarked that Garrett's horse-hoe was a very effective implement, but its price placed it beyond the means of the small occupier.

8th. "The disadvantages of hedge-row trees and small enclosures." The resolution adopted was, "That hedge-row trees, especially the ash and elm, are injurious to the corn and root crops upon all occupations, and tend to diminish the value of the land. Also that small enclosures are disadvantageous, arising from loss of land by the fences, loss of time in the cultivation, by the check given to the free circulation of the air, and by the encouragement they gave to the growth of weeds."

9th. The last question discussed was, "The comparative cost of task and day work, with their respective effects upon the skill, conduct, and condition of the workman." The following resolution was passed, "That task-work is less expensive than day-work. That regulating wages by the quantity and quality of the work performed, gives greater scope for the exercise of activity, skill, and good conduct on the part of the workman; and by placing higher wages within his reach, has a considerable effect in improving his condition."

#### *Beccles Labourers' Friend Society.*

Rewards labourers for bringing up large families with the smallest amount of parochial relief.

"Labourers for long servitude on the same farm.

"Labourers for long servitude with the same master.

"Female servants for long servitude with the same mistress.

"Females for having brought up large families to neat and industrious habits.

"Aged men and women for still supporting themselves by their own industry; and

"Young children, principally females, for earning money by sewing and knitting."



*Ipswich and Ashbocking Farmers' Club.*

First Report of the Ipswich and Ashbocking Farmers' Club,  
Nov. 1840:—

"The questions which engaged consideration and discussion at the several meetings of the Ashbocking Club in 1840 were as follows:—

"1st. The management of Manure in the Farm-yard.

"2nd. On the growth of the White Carrot.

"3rd. On the prevention of the Fly in Turnips.

"4th. On the most advantageous mode of Harvesting the Wheat Crop.

"5th. The best method of preparing Seed-Wheat as a preventive to Smut.

"6th. On the best mode of Planting Wheat.

"The introducer of the subject of the management of manure in the farm-yard, stated that when bullocks were tied up and the straw thrown into the yard and not trampled on, an injurious degree of fermentation was liable to take place; to remedy this evil it was proposed to apply the liquid drainings from the manure, or the water collected from the roofs might be advantageously applied to check the fermentation. This plan was strongly opposed by several members, who were of opinion that the manure from bullocks should not be thrown into a loose yard, where it was not stamped down, and that the fermentation alluded to was, in the first place, an evidence of mismanagement, which would be better corrected by carrying the manure, when removed from the beast, directly on to a bottom of sand, prepared for the heap, and to cover it with mould from time to time as removed; by this means all unnecessary evaporation arising from premature fermentation in the open yard would be avoided, and the ammonia and other volatile salts of liquid manure, which if thrown upon a wide surface of fermenting manure must entirely evaporate, would, to a great extent, be advantageously detained in the mould which covers the heap; and secondly, that where the fermentation did occur, it was opposed both to sound theory and practice, to apply moisture as a means of checking that fermentation.

"After an interesting discussion, eliciting the practices adopted by most of the individuals present, the following resolution was adopted:—

"*Resolution.*—That the best mode of preparing and husbanding the manure of the farmyard appears to be—to take care that no waste should take place of the liquid manure by allowing it to run off, but that either by tanks provided for that purpose, or by a bed of sand so laid as to prevent escape at the sides, every particle of it should be detained. That it is also desirable to prevent the rain-water from the buildings dripping into the yard. That in order to prevent fermentation while in the yard it should be well stamped down, or, where no opportunity is afforded for this, it should be carried on to the heap and covered with mould.

*"On the Growth of the White Carrot.*

"At the meeting in June, in reference to 'the growth of the white carrot,' it was stated, that on the heaviest clay land in this neighbourhood,

upwards of 10 tons per acre of this root had been grown without manure; that the succeeding crops appeared but in a small degree, if at all, deteriorated; that at the time of growing them the experiment had been tried of planting red carrots and parsnips on the same field, and under similar circumstances; these scarcely attained the diameter of half an inch, while of the white carrots few were less than 3, and some upwards of 4 inches in diameter.

*"On the Prevention of the Fly in Turnips.*

"It was stated that much advantage had been experienced from the practice of planting mustard-seed on white turnips, amongst the swedes, in the proportion of one ridge to every 8 or 10 yards; that where this plan is pursued the fly will first attack the mustard, or white turnips, leaving the swedes till they are beyond the reach of harm; and statements were made to show that this mode had been completely successful in preventing the ravages of the fly, and where, as in some instances had been the case, the swede had been planted without such protection, the crop had been lost.

*"On the most advantageous mode of Harvesting the Wheat-crop.*

"The discussion in the July meeting upon the most advantageous mode of harvesting the wheat crop, turned principally upon the comparative advantages to be obtained from the use of the scythe or sickle, and after much interesting exchange of opinion, the following resolution, embodying the estimated advantages, was agreed to. With a view to resuming the question after trials had been more fully and carefully made, it was also recommended that wheat should be cut early, and not allowed to stand till fully ripe.

"*Resolution.*—The best method of harvesting wheat, having undergone considerable discussion, has turned mainly upon the comparative advantages of reaping and mowing; and although the principle of mowing has been adopted to but a very limited extent in this neighbourhood, the advantages were stated prominently to be, that the process of drying is, from the looseness of the sheaves, more quickly accomplished, and the corn consequently earlier fit for carting, the rick in wet seasons thus considerably reduced; and that not only is the expense of haulming avoided, but the land is left in a state fit for immediate tillage. The process of bagging was also alluded to as tending to accomplish the same results, and it is strongly recommended, under the circumstances, that trials should be made upon a small scale, and the results communicated to a future meeting."

*"The best method of preparing Seed-Wheat as a preventive to Smut.—On the best mode of Planting Wheat.*

"The meeting in September was occupied in a very interesting discussion on the best method of preparing and planting wheat for seed.

"In October, the discussion took place on the various plans of planting wheat, whether by drill or dibble, whether in wide or narrow rows, whether by much or little seed, or by deep or fleet planting, in which opinions various as the subjects admitted were held, and appeared to be

sustained by the practice of individual members, the following resolution was agreed to, but not without considerable diversity of opinion as to the latter part:—

“*Resolution.*—That experience has proved, beyond doubt, that wheat requires some kind of preparation previous to planting, in order to prevent smut—for this purpose arsenic, blue vitriol, salt water, lime, &c., have been used with various degrees of success, but from the great facility with which the two first may be procured, and the short time required for preparing the wheat by such means, they are considered preferable to the other methods; and inasmuch as blue vitriol may be used without danger to animal life, it has, in that respect, the preference.

“The best method of planting wheat appears to be with the drill, at intervals of seven inches between the rows, and not less than from two to three inches in depth.

“This meeting, perhaps the most interesting of any, could not fail to impress on the minds of those present, the necessity which exists for institutions of this kind, as nothing could more strongly exhibit the great discrepancy of opinions existing on a subject of the greatest importance, and on which every year affords opportunities of applying, by *comparison*, actual tests by which the *comparative* advantages might be eventually determined.

“It is only by the accumulation of facts, carefully noted from season to season, under the many varieties of circumstances arising from weather and other causes, that we can realise sufficient data, from which we may ultimately deduce a knowledge of those principles by which our practice should be guided; and borrowing the sentiments of Sir John Herschel, to whom the present generation is deeply indebted for his discoveries—‘We must not forget that it is *principles*, not *phenomena*, *laws*, not insulated and independent facts, which should be the objects of inquiry to those who study nature, with a view to the establishment of science.’

“The committee have also the pleasure to report, that at some of the meetings of the club, gentlemen from other parts of the kingdom have attended, and at times handed very useful information. The committee have also to express, on behalf of the Society, their grateful acknowledgment for several presents of books on agricultural subjects; and their attention has, at different times, been drawn to a consideration of the very increased advantages which would be derived from having a depository for the works belonging to the club, and making such arrangements as would furnish it with a valuable library of agricultural works, as well as a room for the purpose.

“In connection with this subject, a proposition of even a more extended nature has been so far entertained by the committee, as to induce them to call the attention of a general meeting to it:—To provide, either by purchase or erection, a suitable building, as an Agricultural Hall, in which a room should be provided for the opportunity of holding, as occasion may require it, meetings of the society at large, and for the library, and a museum. It is thought that a sum from 1000*l.* to 1500*l.* may be raised by subscriptions and shares, and sufficient for

the purpose; and as far as the opinion of gentlemen interested in agriculture have been ascertained, it is believed that but little difficulty would arise in providing the amount required; and when it is considered that the county of Suffolk holds no mean place in the scale of agricultural experience, and that here we are met in the capital of the county, it would surely redound not less to the credit of the club, than tend to the further advancement of agricultural intelligence."

*Wrentham Farmers' Club.—Fifth Report, 1843.*

The following is a brief review of the discussions and resolutions contained in this report:—

*"1. Of Belgian Carrots, as compared with other roots.*

"The introducer considered that white carrots may frequently, as a change, be cultivated to more advantage than turnips, particularly on poor soils, as under good management a much heavier crop has generally been produced; and although, it was allowed, the labour and expense of cultivation was greater than for other root crops, still the increased quantity obtained would be found more than equivalent for such extra expense incurred. In experiments which he had recently made with regard to the comparative weights grown of carrots, beet-root, and swedish turnips, the result was considerably in favour of the former.

"To effect a good preservation of the root it is essential to have a small portion of the crown severed with the top. This practice enhances the value of the tops as cattle-food, and it was considered that the manure left upon the land by sheep feeding on the carrot-tops, with cut hay, was equal to that from a third crop of common turnips. The result from manuring for the carrot crop was not sufficient to warrant an application, and on two pieces, one with manure and the other without, little or no difference was perceptible; under such circumstances it is desirable to apply the manure thus intended to the following crop of barley.

"Where game extensively abounds, the cultivation of this root has almost invariably been found a failure.

*"2. On the system of Artificial Feeding of Cattle on the principle advocated by Mr. Warnes.*

"The introducer believed it would be good policy to consume the native produce of barley with linseed, especially when below a remunerative price.

"The advantage attending the home growth of linseed was considered rather questionable, the climate as well as the soil in this locality not being considered congenial; and in one or two instances, in which it had been cultivated on a small scale, the crops obtained were not sufficiently remunerative to induce a second trial. But it would appear advantageous, with a low price of corn, to purchase the linseed for the purpose of making the compound, should it be found to answer for extensive use. The adoption of the system, by way of experiment, was particularly recommended.

*" 3. Barley Sowing with regard to the preparation of the land.*

" From the remarks offered on this subject, it appeared that, as regards light soils, a good crop of turnips was the great desideratum; and when fed off, at least two ploughings should be given—the first to be fleet, the second deeper. Where beet is grown it was not considered desirable to plough more than once; those lands, having received the frost, would seldom be brought into a better state.

" With regard to heavy land, some difference of opinion prevailed as to whether a good clean fallow, or the growing of tares on such soils, were the better system; it was, however, generally admitted that, as a preparation for barley, the cultivation of tares had a favourable effect upon that particular crop, although it appeared rather questionable if such were the case with the crops that followed. If the land shall have been sufficiently pulverised by frost, harrowing with heavy harrows was strongly recommended in preference to cultivating, this latter practice having frequently been found injurious.

" Drilling the seed was the system generally adopted, although in some case, on heavy lands, sowing had been successfully pursued. The proportion of seed depended much upon the nature of the soil, varying as stated from six to twelve pecks per acre. On light lands, and more particularly on poor soils, thin sowing was recommended; while on lands of better quality a heavier seed was deemed essential. A member, farming on good mixed soil, had observed that by increasing his seed from 10 to 12 pecks per acre, he obtained barley of better quality, without either increasing or diminishing the produce.

" The meeting agreed:—

" That in preparing land for barley, on light lands, two ploughings are requisite before sowing; but on stronger soils, after the land has been sufficiently pulverised by frost, no further ploughing is advisable. On either descriptions of soil, harrowing with heavy harrows at the time of sowing is in most cases to be preferred to cultivating. That drilling on all lands is the most desirable system; and that a seed varying from eight to twelve pecks per acre is considered as most adapted for this locality, which it is necessary should be occasionally changed.

*" 4. The best method of growing beet, whether ridge or stretch.*

" At a previous discussion, in April, 1840, no conclusion was arrived at on this particular point; each system, it was believed, having its peculiar advantages. It was now contended that under the ridge system of cultivation more weight of root and better quality were obtained; that they grew clearer and were less fanged, and can be removed from the land with less injury. It was considered essential that the operations of ridging and drilling be performed with the greatest exactness to give facility for cultivation with the horse-hoe.

" The objections to the system were that, on heavy lands, in a dry time, there is more difficulty in obtaining a plant from the want of sufficient pulverisation.

" The majority of members present being of opinion that on all descriptions of land, where a sufficient degree of pulverisation exists, the ridge system is to be preferred; a resolution to that effect was accordingly adopted.

" The discussion on this question led to sweepstakes being entered into for competition on both principles of cultivation, which it will be seen were awarded in favour of the ridge at the annual show of roots in November.\* The decision of the judges being as follows :—

" Mr. Hingeston, a field of beet on the stetch, against Mr. Girling, on the ridge. Awarded to Mr. Girling.

" Mr. Tallant, a field of beet on the stetch, against Mr. Girling, on the ridge. Awarded to Mr. Girling.

" Mr. Riches, a field of beet on the stetch, against Mr. Girling, on the ridge. Awarded to Mr. Girling.

" Several premiums from the Labourers' Fund were also awarded to the occupiers of cottage allotments for the production of vegetables, &c.

" 5. *The effect of growing tares on heavy lands, and the advantages or disadvantages resulting therefrom.*

" Tares were considered to have the effect of producing an abundant crop of barley, but to have an injurious effect to the layer and following wheat crop; although it was believed the growing of tares did not prevent the obtaining a plant of clover, but it materially interfered with its growth afterwards. The meeting was, however, of opinion that the growth of tares on lands of the above description was, in many respects, highly desirable; and in order to find a remedy for the evil complained of, it was generally agreed that they may be advantageously cultivated to a moderate extent, not exceeding one-half of the fallow, provided peas or beans are grown in lieu of clover the following course, thus taking a layer once in eight years, and it is considered very essential that the greater proportion of the tares be fed off upon the land by sheep.

" This system was believed to be decidedly preferable to growing turnips extensively on heavy lands.

" 6. *The effect produced by different kinds of roots upon the following crops.*—Swedes and beet were considered to produce a nearly similar effect; but on heavy lands it would appear that generally the after-grain crops were the best where beet had been taken, while on other soils swedes were believed to have produced this effect. In most cases on light lands better barley was obtained after common turnips than from either beet or swedes; and where the turnips are fed off by sheep, it is but fair to assume that such would be the case.

" The growth of carrots, as far as observation with regard to their cultivation extended, was not found to have a deteriorating tendency towards any of the succeeding crops.

" Potatoes were allowed to be most decidedly of an exhausting nature; but as an abundant produce is generally obtained, something may fairly be allowed as a sort of deduction from the following crop of barley. Upon the whole it is inferred that (with the exception of potatoes) where an impartial treatment has been given, or such treatment as is peculiar to each description of root, no material difference has been perceptible further than the effect of seasons or the particular time of sowing.

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\* This method of deciding a moot point is worth more than any discussion upon the subject, and it is worthy of more general adoption.—H. R.

"7. *The most approved treatment of lands tired of growing clover, or what is termed 'clover sick.'*—The deficiency of gypsum in the soil was attributed as a principal cause of failure; but in this district its application does not appear in any single instance to have been attended with successful results. It was therefore recommended, in order to secure a plant, to lay down the land but once in eight years; and, as its failure is principally confined to poor heavy soils, the cultivation of peas or beans in alternate courses was considered in no way disadvantageous.

"8. *The utility of working pea and bean stubbles as a preparation for wheat.*—The system of breaking up bean-stubbles, though advocated by the introducer of the question as a means of checking the growth of weeds and as a preparation for the root-crop following wheat, was decidedly objected to, and proved in many instances to have been productive of the greatest injury, frequently causing the wheat to become root-fallen; and it is also generally found that more advantage will accrue to that crop by ploughing in all superfluous weeds rather than by breaking up the land destroy the solidity so essential as a preparation for wheat; and where lands are free from grass, the propriety of even discontinuing our present system of ploughing up bean-stubbles was urged. The previous crop under such circumstances having been manured for scarifying, in that case was believed to be more desirable; and as regarded cleaning the land, working it for that purpose when a barley stubble was considered preferable.

"The opinion of the Meeting being decidedly against the working of pea and bean stubbles for wheat, a resolution to that effect was agreed upon.—*December 8th, 1843.*"

*Wrentham.*

"At a recent meeting of this club a discussion took place on the most effective means of hindering the destruction of the wheat-plant by slugs and wire-worms. With regard to the former of these, several remedial measures were stated to have been pursued; the application of soot, lime, or common salt in small proportions, had each been attended with some degree of success. It would appear necessary that the application of any of these substances be in the night only; for unless the slugs are exposed at the time of sowing, such measures would prove ineffectual. Another plan pursued was that of slicing turnips about the land; but the most beneficial effects were experienced by strewing the land with the tops of turnips only, and in sufficient quantities to afford ample food for these mollusca. Where this latter system has been adopted, the result has generally been that the plant of wheat has been preserved, while the leaves of the tops have been almost entirely consumed. The injury done by slugs is principally confined to an early stage of the wheat-crop, while the ravages of the wire-worm frequently extend over a length of time, and affect the crop at different periods of its growth. In reference to the latter, early ploughing, and afterwards obtaining a sufficient degree of solidity, may be considered as practically among the best means to be taken as a preventive. The effects of such a system have also frequently been apparent, not only as

a protection from wire-worm, but with reference to the ultimate value of the crops. The wire-worm is generally most destructive on lands which have been fed through the summer, and also on others where the previous layer was not good. In these cases shallow ploughing, as well as an additional quantity of seed, was recommended. Treading the land by sheep after the seed is deposited, had also been practised with a view of obtaining more solidity. When, however, the crop is affected in the spring, as (notwithstanding these precautions) is too frequently the case, the greatest benefit appears to have arisen from lightly breaking the soil either by light harrows or even raking as early as circumstances may render practicable. A resolution was passed in accordance with these observations.—T. D. ROBINSON, *Assist.-Sec.* Feb. 1844.”

*Debenham.*

“ *Comparative advantage of Stall or Pasture Feeding Cart-Horses.*—Resolved, That the system of stall or yard feeding cart-horses in summer with vetches or clover is decidedly preferable to turning them out on the pastures; that vetches for the lands in this district, which are generally heavy and farmed according to the four-course system, are the best and cheapest green food that can be grown for the purpose of soiling—the cheapest, because they are grown on land intended for summer tilth, which, if properly attended to when cleared of vetches, is not exhausted or impoverished; on the contrary, the vegetable matter which falls from or is left by the tare improves rather than deteriorates the land for the barley crop—the best, because vetches produce the greatest quantity of food per acre—the earliest and the most nutritious. The vetches cut into chaff with a portion of hay, straw, or any other kind of dry fodder, may be better used for food for cattle than when given without being so cut, which in a season like the present, when the stocks of hay are unusually short, is a matter of very great importance to the farmer. Vetches ought not to be continued on such land beyond the end of June; that clover should follow as the next green food, which will find a supply until the harvest is finished. That neither clover nor vetches should be given unless withered for twenty-four hours.—W. G., *Hon. Sec.* March 20th, 1845.”

*Yoxford Farmers' Club. Fifth Report.*

“ The subject proposed in February, 1844, was on the *best manner of fattening beasts and sheep in the winter season.*

“ *Resolution* :—It is the opinion of the members present that the best method of fattening bullocks in the winter season is by giving them that description of root first, which will deteriorate most by keeping; consequently common turnips should be given first, then swedes, and beet-root last: in all cases the roots to be cut into troughs, care being taken that they have the food regularly, and not too much by them at a time. With the above food, it is desirable to give good hay, with oil-cake, and pea or bean meal mixed with a sufficient quantity of cut hay, in order that the corn may be consumed without waste. The proportion of corn and cake given must depend on the size of the



bullocks, the quantity of root in hand, and the time most desirable to get them to market.

"Bullocks tied up in a shed are considered to consume less food and to fat quicker than if allowed to range over a yard. Boiled linseed is also strongly recommended. In fattening sheep on roots it is advisable to cut the same into troughs, and to consume the food where it grows on mixed soil and light lands; by this method they may be confined in a fold, and made to go over the land in a regular manner and deposit the tathe equally. Hay of good quality should be given sheep at all times during the winter months; and where quick fattening is required it is the opinion of this meeting that a pint of peas or oats each per day should be given mixed with cut chaff. The members present not having been in the habit of giving sheep oil-cake or linseed, do not feel confident to decide if either would be more advantageous than corn."

*Eighth Report. Nov. 10, 1845.*

*"The proposed bill to consolidate and amend the laws relating to parochial settlements.*

"The members were of opinion that all parochial settlements, by whatever means acquired, are bad in principle, and tend to oppress the labouring man, acting very injuriously on the morals of the labouring classes, by narrowing the field of their exertions.

"The members urge the importance of district settlement and management of the poor, and that all the property in each district be rated for the purpose of raising a common fund for the general management of the poor, and that the landlords (in lieu of the tenants) should be assessed for every cottage tenement or occupation that may be under the annual value of 10*l*.

"The above plan will give the skillful labourer greater liberty to carry his labour to the best market, as under the present law of parish settlement the inefficient and honest workman stand upon the same footing.

"If the principle of district settlement and management of the poor be recognised and adopted, it might be then further extended to a county, and ultimately merged in a national system.

*"The relative position of landlord and tenant with respect to the great variation in the value of agricultural produce, and the most desirable method of ensuring a fair protection to both, with regard to letting and hiring,* came under the consideration on February 17th, when a unanimous feeling was expressed by the members present that long leases, based upon an equitable corn-rent, would operate with equal benefit to landlord, tenant, and labourer: to the landlord, because his estate would be kept in a better state of cultivation from his tenant being in a safer position to employ the necessary labour, added to the comfortable assurance held by the lord of the soil, in seeing his farms tenanted from father to son in that social, hereditary compact known in former days; to the tenant, because he would have a greater prospective encouragement for investing his capital; and to the labourer, from the foregoing facts operating materially towards ensuring him more constant work.

*" Whether beet or turnips were the more desirable roots to cultivate on heavy land.*

*" Their comparative merits were embodied in the following resolution :—*

*" Beet is considered the best root to grow upon a heavy-land farm, owing to its greater certainty of plant, and early maturity, consequently allowing the same to be secured before the land is sodden with wet; thus affording an opportunity of ploughing the land previous to the winter, and doing less injury to the succeeding crops.*

*" Skirving's swedes are recommended as affording a longer time for making a fallow, the same to be drawn and clamped in November, and the land ploughed as early as possible for the following crop. These two kinds of roots to be sown on two-thirds of the land intended for root crops. The remaining third to be of pudding or white loaf turnips; the latter for feeding stock till January, and then to be all cleared off the land.*

*" The land intended for the beet and swede crop to be ploughed and cleaned, as far as the season will admit, immediately after harvest, and laid up as dry as possible for the winter.*

*" The propriety of sowing a portion of the land intended for long summer-lands, on heavy-land farms with cole-seed, with the view of foddering the same off with stock.*

*" The conclusion drawn from practical results detailed by a few of the members was as follows :—*

*" 1st. When autumnal food is required, the land should be made a good summer-land by the first or second week in July, and sown with cole-seed immediately, the crop therefrom arising being fed off at the latest by the latter part of October.*

*" 2. But where it is desirable to obtain spring food, it is recommended that the land intended for long summer-land the following year, should be ploughed up immediately after harvest, and sown with cole-seed, with a mixture of rye and tares, with a view of securing a very thick plant, and the same fed off the following spring, by these means affording ample time for making a good summer-land for barley.*

*" In the first case, this is considered a very excellent preparation for wheat, and should the autumn prove unfavourable for feeding the crop, it might be advantageously ploughed in for manure.*

*" An inquiry into the expenses of the different modes of Draining, with the best method of performing the same.*

*" The following conclusions were the result of the discussion :—*

*" 1st. That mole-plough draining may only be adopted on lands with a fair fall, and it is recommended to draw a level furrow about eight inches deep before the mole-plough, which operation, from the land being internally moist and externally dry, is best done in the spring. The main drain should be immediately cut with the spade, for should a fall of rain occur previously to such being done, it would materially spoil the mole-drains. The whole of the foregoing operation will not*

exceed the sum of 1*l.* 11*s.* per acre, the drains being drawn every eight feet.

"2nd. For spade-draining, the furrow should be drawn as deeply as possible, and level at the bottom, the men following with the spades and increasing the depth to 31 or 32 inches. The leading drains to be full four inches deeper and considerably wider than the others, and in hilly land at a good distance from the headland. Sharp angles to be avoided in the leading drains, the water falling into them as obliquely as possible. This method, six yards from drain to drain, will give seven score poles per acre, which, including man, horse, and material for filling in, may be performed for 2*l.* 1*s.*

"3rd. Tile-draining may supersede with advantage the foregoing plans, where there is sufficient length of lease, on loose or gravelly soils, since the draining, filled with the best material, quickly becomes imperfect and totally inefficient; the operation should be done as deeply as possible, and if a natural fall be wanting, this defect must, if practicable, be supplied by an artificial one. The cost of tile, digging, manual and horse labour for six score poles per acre—which on such soils is deemed sufficient—will not exceed 3*l.* 15*s.*, though such outlay would of course be increased if there were far to cart the tiles. All the foregoing calculations were made assuming wheat to be worth 6*s.* per bushel.

*"The propriety of carrying clay, marl, and heavy stuff on our arable lands.*

"It is recommended to cart clay on clover, bean, or pea stubbles for wheat at the rate of 25 loads per acre, since by such process the straw is stiffened, the quantity of grain increased, and the quality decidedly improved. This is to be understood with reference to deep-soiled, tender, heavy land: clay will also be found beneficial on lands that grow a superabundance of straw and corn likely to lodge; but is not to be carted too freely on thin-skinned heavy land. Too heavy a coat of clay on old-ploughed land will do harm for several years by setting it fast. Clay may be profitably applied to layers and beans, but is thought somewhat injurious to barley and turnips. In all cases the quality of clay should be well considered, as, if very stiff, the same benefit will not accrue as from the use of a milder description.

"Marl was reckoned very desirable for mixed-soil land; chalk rubbish beneficial on lands where turnips were liable to anbury; and marsh ooze preferable to clay on mixed-soil and light lands. Probably the same observations would apply to heavy land."

*Framlingham Farmers' Club.—Fourth Report, 1843.*

*"The most advantageous mode of consuming the root crop.*

"1st. That, as there is but a small proportion of sheep-feeding land in this district, it would be advisable to apply the greater part of the root-crop to the feeding of cattle in yards, beginning first with common white turnips, after these swedes, then white carrots or mangold-wurzel, cutting all into slices, and giving therewith bean or pea meal.

"The next resolution (agreeing with one passed December, 1841, recommending that some sheep should be kept, even upon our heavy-land farms) was to this effect:—That a portion of the root-crop ought to be appropriated to the trough-feeding of sheep in the yard or meadow during winter.

"The third decision states, that too much root is usually devoted to the purpose of feeding milch cows, and recommends that a smaller quantity of turnips *only* should be used for them—a cart-load per day, as drawn, being sufficient for eight.

"The fourth resolution, in order to economise stover, provides—'That roots may be beneficially given to cart-horses, at the rate of half a bushel per day, with chaff, and a like quantity of corn per week.'

*"On the best method of filling up a deficient plant of wheat."*

"It was recommended that no attempt at filling up should be made when the plant is regularly deficient one-half or less; but if only one-fourth of the seed vegetated, it was considered advisable to plough the plant up.

"In case of naked patches occurring in the field, it was advised to dibble in Talavera wheat in February or early in March, or, as was thought might be better, the new April wheat instead.

"A strong opinion was entertained that transplanting from those spots which have taken well, might succeed better than any other experiment in the last-mentioned case. It was calculated that an acre might be transplanted for 25s.; consequently, if such a scheme is practicable at all when the land is wet, half a plant might be made good for 12s. 6d.

"Filling up by dibbling or sowing, it was said, should be commenced early, in order that it may come to maturity with the rest of the crop, and also that time may remain for some other course to be pursued if necessary. The drill should never be used for this purpose, as it is apt to root up that which has taken; and besides this, when strong land is wet, drills deposit the seed too deep, and make furrows for the water to lodge in. This last remark applies to the drilling of wheat on heavy land, at any time of the year, in very wet seasons; so that sowing by hand, if possible following the plough, is best; or if the drill be employed, it should be without coulter. Putting in wheat near before Christmas was thought to be less likely to succeed than if deferred until February or March. Sheep-feeding, with repeated harrowings and rollings, were highly approved in cases of thin plants; and when suffering from wire-worms or slugs, six or eight bushels of salt per acre may be used likewise with good effect; if the land will bear it, heavy treading with cattle may also be tried.

*"On the propriety of paying more attention to the drainage from our farm-yards."*

"The opinions upon this subject are contained in the following extract:—

"That too little attention has hitherto been paid to the collection

and preservation of our liquid manure, and that it is advisable to form a tank in some convenient place upon every farm.'

"And in addition to a tank, that a reservoir should be dug as a general receptacle for all manner of weeds and rubbish, border stuff, loam, marl, sand, or clay, to empty the tank upon it as it fills.

*"The best description of vegetables to cultivate for stock-feeding.*

"It was proposed and adopted by this meeting, 'That it is desirable not to confine ourselves to a large growth of any one particular kind of root, but to grow a portion of each, so as to have at least a succession of turnips and beet.' To this a recommendation was added, 'That, as our success in farming depends so materially on keeping our land clean, it is prudent to limit the breadth of land devoted to root-crops, so as to have a larger extent in fallow; the farmer is thus enabled to do more to ensure a full crop, and to use the hoe with greater effect.'

"The variableness of soils and seasons, and consequent risk of failure attending the cultivation of this species of food, when we confine ourselves to any particular kind, the adaptation of the various kinds to different sorts of soils and stock, and different periods of the year, together with the supposed advantage accruing to the land by changing the description of plants grown upon it, were held to be sufficient reasons for introducing as many varieties into our root-crop as possible.

"The common turnip was decided to be equal, if not superior, to any of the roots when fresh, but highly objectionable when long removed from the ground; its succulency is soon lost by clamping, and decay quickly ensues: it is expedient, therefore, so to regulate the quantity grown, that it shall be consumed soon after Christmas.

"A few words were spoken on behalf of Scotch and pudding turnips for grazing purposes, but both were objected to: the first, because, although acknowledged to be rich and sweet, it usually runs very small in this district; the last were liable to injury from frost, on account of their standing so far out of the ground. Swedes were reported to be very valuable to the grazier, to succeed the common turnip; and a considerable outlay for hay and corn may be saved by giving them to horses early in spring. Beets were highly extolled for the valuable property which they possess of keeping to a time of the year when all other food is scarce. No occupation, it was said, ought to be without a portion of beet; if the soil is not favourable, the recommendation noted in the foregoing resolution should be acted upon. In comparing the value of the three roots as articles of food, beet was allowed to stand first for all kinds of stock, except young stock, and when given too freely to cows. Swedes occupy the next place, and after them the common turnip; but the choice, of course, must be determined by the nature of the land.

*"The merits of Italian rye-grass and other artificial grasses.*

"Some gentlemen having found, notwithstanding the abundant produce of Italian rye-grass, that they were sufferers by the extreme difficulty of eradicating it from the ground, and by the consequent injury to the succeeding crops, the question of its merits was laid before

the meeting. From the information elicited, it appears the difficulty referred to has not been by any means general. It seems to have arisen either from too early sowing, or too late feeding or cutting, whereby the plant has been allowed to seed upon the land. Some have sown in March, others not till June or July; the first complained, the latter spoke well of it; and by late feeding, some of the heads seed and vegetate in the succeeding crops. The quantity of seed sown also varied exceedingly; two bushels per acre (broadcast) if alone, and three pecks with clover, were said to produce a good even plant of fine quality, which smothers the weeds and comes early to seed; less seed grows in tufts, coarse in quality, difficult to clean, and troublesome to remove from the land. Being ready to turn into before any other green crop, Italian rye-grass is highly esteemed by many of our neighbours; but several objected to sowing it with clover, because they do not arrive at maturity at the same time, the grass seeds being ripe before the clover is ready. This inconvenience, it was said, might possibly be obviated by sowing it after harvest, instead of spring-time. Experience has shown that it does very well when sown at this time of year; it was, therefore, considered an excellent thing for filling up deficient layers. Sowing it on wheat for early feeding, where fallow succeeds, was much approved of. A member, who has grown it for seed, says it then affects the after crops, and he finds it necessary to let the land rest till the scattered seeds vegetate, before he ploughs.

*“ On the payment of labourers' wages partly in kind.*

“ The introducer of this subject was one of the remaining few in this neighbourhood who still supply their labourers with wheat in part of wages. His system being to sell wheat to his labourers at the nominal price of 6s. per bushel, the allowance being a peck to the man, half a peck to the woman, and half a peck to each child; compelling no man to take more than he wants, and permitting no family to take more than a bushel per week. His standing wages he calls 9s. a week; therefore he who requires a bushel of wheat has 3s. cash in addition; he who takes half a bushel, 6s., and so on.

“ The advantages of the system were stated to be a saving in the amount of wages, and of the expense incurred in carrying the wheat to market; and on the other hand, the labourer receives a fair and regulating system of wages, and obtains his food at the first cost, the flour-dealer's profit being divided between the master and servant. The trouble of measuring out the corn and keeping the account was acknowledged to be considerable, but much more than compensated for by the advantages referred to.

“ On the other side, it was argued that the practice of paying labourers in kind was nothing more than the truck-system, which has been so universally condemned, and therefore a curse or a blessing to the labourer according to the disposition and necessities of his employer. In the hands of benevolence, if the means co-exist, the poor will certainly reap good. ‘ But,’ observed one gentleman, ‘ it is not a system for general adoption, as it opens the door for oppression; human nature is such, that when a man's interest and his duty are opposed to each

other, the former is too likely to obtain the mastery.' It was further shown that the plan of giving wheat as part of wages did not always work fairly; for example, if wheat is worth 30s., a man may get a bushel, value 7s. 6d., and 3s. cash, making 10s. 6d. for his week's work; another, an equally good workman, only gets half a bushel, value 3s. 9d., and 6s. cash, together 9s. 9d.; making a difference of 9d. a week, which increases as corn advances. When wheat is below 24s. the man who takes the least has the advantage; but as the averages run higher, the system manifestly acts as a premium to married men with families. Many other arguments were employed on both sides, and the debate ended in the following resolution being passed:—

“ ‘ That it is better to pay wages in money, and let the men go to what market they please.’ ”

“ *The management of swine.* ”

“ It was resolved—‘ That every 100 acres should be stocked with two breeding sows; that these should be long, and the hog short; that pains should be taken, if possible, to regulate the time, so that the pigs fall conveniently for shack, and that they do not come in the depth of winter; and that the sow is well kept whilst the pigs are upon her; soaked beans, barley-meal, and milk be supplied to her liberally, and increased in quantity as the pigs grow. At the end of six weeks the latter may be weaned, and a fortnight after this cut, care being taken that they are fasted for twelve hours preceding the operation. From this period, until they are shut up for fattening, it is right they should be maintained in thriving condition, first with soaked beans or barley-meal and dairy waste or milk, till they are a quarter old; then give them the run of the bullock-yard or the meadow, with from half a pint to a pint of corn per day during the winter, and tares or green beans from the field in the summer. For fattening, barley and peas, mixed and ground, were recommended, with whey or milk, all given in limited but sufficient quantity at stated intervals. Soaked beans were believed by some to possess superior fattening properties. Lastly, an opinion was given that hogs cannot be profitably kept beyond fifteen months.’ ”

“ *The Dairy versus Grazing.* ”

“ As a pecuniary speculation, dairying was allowed on all hands to be attended with the least risk. But the ruling maxim is, ‘ Cows, bullocks, and sheep—some of each and too many of neither;’ but it is one which requires mature judgment to act upon. It is influenced by so many varying circumstances as to make it impossible to fix upon any standard proportion for a given number of acres; the seasons, the climate, the size of the farm, the extent and quality of the pasture as compared to the ploughed land, the distance from home and from market, the prices which generally rule at the market, the plan of the premises, &c., every farmer knows, must all be considered in apportioning the stock upon a farm. Upon the average quality of land in this district, with from one-third to one-fourth pasture, it was believed that four cows, three or four bullocks, and forty lambs, would be something like a fair proportion for 100 acres.

*"Halesworth Farmers' Club."*

"This club numbers more than 100 members at the present time, and one of the most interesting features in this society is the exhibition of cottager's allotment productions, generally held in the month of November, previously to the annual dinner. In 1847, 10*l.* was awarded in prizes to the successful candidates; the number of competitors was about 135.

"Among the subjects discussed during the year 1845, was, 'The propriety of effecting a general equalisation in the prices of farm labour with the current prices of agricultural produce.'

"The majority of the members preferred taking wheat as a standard by which to regulate the price of day-wages, the average price of which should be ascertained from the corn-inspector's returns of the different market towns in the vicinity; and when necessary to have farm labour performed by the day, it was considered highly desirable to establish one uniform system of payment, according to the prices of agricultural produce, such payment to vary at the rate of 2*d.* per day for every fluctuation of 1*s.* per bushel in the value of wheat."

Among the subjects for discussion named in the Annual Report for 1846 will be found the following:—

*"The best method of managing stock during the winter season upon occupations not suited to turnips."*

*"Resolution.*—'Owing to the considerable outlay in artificial food incident to carrying out an enlarged system of grazing upon such farms, the raising an average quantity of stove stock is to be preferred. Amongst the various auxiliaries to be used for either purpose, a proportion of corn, oil-cake, linseed-meal or compound, and also boiled barley, at the rate of from half to three-quarters of a peck per day, pollard, &c., are severally recommended, regard being had to the quality and description of the animal, and the marketable value of each kind of food at the time when the same is employed.'

*"The best method to be pursued in breaking up old pastures, and also the most desirable way of laying down ploughed land for permanent pasture."*

"The views of the meeting may be derived from the clauses embodied in the following resolution:—

"That it is the unanimous opinion of the members that the best system to be adopted in breaking up old pastures is—first to pare and burn the sward arising therefrom as early as the season and other circumstances permit, and subsequently prepare the land for a root-crop, by giving such ploughings and other dressings as may be deemed necessary; and that with regard to laying down arable lands for permanent pasture, great care should be exercised to make a clean fallow, to drain the land if wet, the grass-seeds to be judiciously selected according to the nature of the soil; and it is further recommended, not to feed such new leys with heavy stock for the first two years, but to allow the grasses to shed their seeds as much as possible (renewing



such descriptions in the mean time as may appear in deficient quantities), after which a covering of manure, at the rate of from 10 to 15 loads per acre, would prove highly beneficial.

*“ On the Report of Her Majesty's Government from the Commissioners of Excise, in respect to feeding cattle with malt.*

“ In reference to the experiment, the object of which was to ascertain the relative value of barley and malt when employed to fatten two bullocks, the following observations were made by the gentleman who introduced the subject:—‘ This trial is, in my opinion, by no means satisfactory: after the first fortnight the bullocks were attacked with the foot epidemic, and although the experiment was continued nearly four months, it appears that, either from the effects of the disease, the large quantity of grain given, or the bad state of the turnips, the functions of the digestive organs of the bullock fed on barley became deranged and his health much impaired.’ In the resolution which followed the discussion it is stated, ‘ That although they (the members) are duly sensible of the scientific manner in which the investigations have been conducted; nevertheless, owing to the limited scale of the experiments, especially with regard to the feeding bullocks, and the adverse circumstances connected therewith, they do not regard such experiments as satisfactory or conclusive, but confidently hope that fresh trials on a more enlarged scale will be instituted under the guidance of practical farmers, and the result thereof reported to the club at some future period.’

*“ The Game Laws. (11th September, 1846.)*

“ The late resolutions of the Lords' Committee were presented to the meeting, in consecutive order, and were unanimously pronounced to be both vague and unsatisfactory.

“ Extracts having reference to the assessment of game, and the baneful effects of strictly preserving, were quoted from the Earl of Euston's liberal pamphlet addressed, about two years since, to the magistracy of the western division of the county, and gave rise to many interesting observations.

“ *Resolution.*—‘ That the present game laws (especially those which relate to hares and rabbits) are highly prejudicial, not only to the occupiers of the soil, but to rate-payers in general; involving as they do, considerable and undue expenses in regard to the convictions which occur under such laws—and are equally objectionable, in consequence of their injurious operation on the morals of the labouring classes.’

*“ The principles of breeding animals, adapted respectively for the dairy and grazing purposes.*

“ The introducer observed that the animals which produce the largest proportion of fat and muscle with the smallest consumption of food, are the Herefords and Short-horns; the former of which will fatten at the age of two years to sixty stones, whilst the Scot or Home-bred would require four years to attain an equal weight.

“ This fact was deemed to be of the highest importance, inasmuch

as the value of a breed of cattle ought not to be determined by the profit which is yielded between buying and selling, but rather that which is produced to the breeder and grazier conjointly, from their birth to maturity.

"The following table exhibits the distinguishing characters of animals possessing the properties of fattening or grazing, as compared with those which indicate the faculty of yielding milk, viz.:—

*"For Grazing.*

"*Head*—small; muzzle fine; ears large, a little erect, and transparent.

"*Neck*—short, light, and nearly straight; small from the back of the head to the middle; dewlap large and loose.

"*Chest*—wide and round; ribs deep and barrel-shaped; great depth behind the elbow.

"*Back*—straight from the shoulder to the tail, and well filled up with muscle; hips wide.

"*Belly*—nearly straight.

"*Quarters*—full, long, and large; the muscles reaching close down to the joints; legs short; bones small and flat.

"*Tail*—falls perpendicularly down the line of the back.

"*Udder*—Firm, fleshy, and the milk-vein small.

*"For the Dairy.*

"*Head*—Large; muzzle coarse; ears rather pendant, and tinged yellow inside.

"*Neck*—long, slender, and tapering towards the head, with but little loose skin below.

"*Chest*—deep, but narrow, and strikingly deficient in the substance of girth; ribs flat and wide apart.

"*Back*—narrow; joints wide and loose; bones prominent; hips narrow.

"*Belly*—large and drooping.

"*Quarters*—muscle thin, but very firm.

"*Legs*—long, coarse, and inclined to be sickle-hammed.

"*Tail*—set on low; haunch drooping to the rump.

"*Udder*—large, thin, and loose, and the milk-vein very prominent.

"The disappointment of breeders, it was affirmed, are mainly attributable to the exercise of an improper judgment in the selection of their stock, a very prevalent error being that of crossing between a male and female of opposite descriptions and characteristics, without regard to the kind of animal sought to be produced. It was well observed, that it is difficult to combine the qualifications of an extreme aptitude to fatten with the properties of producing milk to any degree of profusion, inasmuch as the perfect development of form necessary to ensure the one is invariably accompanied with a corresponding failure as regards the other.

"Supporting these views, the speaker alluded to the mischief which, in his opinion, had been produced by the unwise practice of attending too exclusively to the attainment of a propensity to fatten as applicable to our native breed—the old Suffolk cow—which, he contended, should

be estimated principally for her rearing and milking qualities. A long series of useful remarks followed, and the meeting separated without coming to a resolution."

*Clod-burning.*—The following was the resolution come to on this subject by a club in the centre of the clod-burning district :—

"The general feeling of the meeting was decidedly in favour of clod-burning. A calculation was made that if 25 loads per acre were burned and carried off the land, it would not reduce the soil more than a quarter of an inch; this, however, is not done—the soil, when burned, is again restored to the field, although in an altered and more desirable form. By the operation of the fire it is rendered light, friable, porous, and highly absorbent of gaseous matters, and therefore well calculated to improve the texture and fertility of heavy retentive land; it makes it more pervious to both air and water; it increases the efficiency of the drains by letting the water more freely to them, and, being more friable, the land works better at less expense. It further promotes vegetation by converting into soluble matters, available to plants, vegetable remains which, in consequence of the usual wet impervious nature of the soil, have become, as it were, indigestible, and therefore inert and useless; it likewise has the effect of ensuring the future benefits of such substances. It was advocated as being destructive of the roots and seeds of weeds; of insects, their larvæ and eggs; and, as it was pretty clearly demonstrated, it enabled land to bear the same crop in quicker succession, by its supposed effects on the exudations left by former crops."

In these discussions it appears that the introducer of any subject first delivers what may be called a plain and suitable lecture on it. The members give their opinions for or against. A resolution is formed either unanimously or by a vote of the majority present, and the secretary draws up a succinct account of the various opinions and the result arrived at. Business being disposed of, the evening is concluded in a friendly and social manner, but generally no refreshments are allowed to be called for while the club discussions are being carried on. The meetings are generally held at the principal hotel in the town, or if there are two nearly equal, they are sometimes held alternately at each. At the annual, which is often also the anniversary meeting, small prizes are given for roots, &c., sweepstakes entered into between the members are decided, and, if possible, the company and information of some eminent agriculturist or lecturer is obtained.

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VI.—*The Agricultural Labourer—his Condition and Manner of Life, &c.—with a Catalogue of the Local Words in use among the Labouring Classes.*

MANY short paragraphs under the head of "Condition of the Agricultural Labourer" will be found in former pages of this work, from which it may be gathered that the Suffolk labourer is at least equally well off with any in the southern counties. Suffolk, it must not be forgotten, is now entirely an agricultural county (the employment and support of the poor therefore falls wholly on the tenant farmer), and its population, 315,073 in 1841, has increased more than 50 per cent. since 1801. This population, one to three acres, is extremely dense for a county wholly without manufactures; I say wholly, because those at Sudbury, Lavenham, &c., are too trifling to deserve mention, and, small as they are, are *decreasing*.

Such a density is probably unequalled by any other *wholly* agricultural district, and nothing can show more strongly the improvements that must have been made in Suffolk agriculture than the fact that, in spite of this increase of numbers, in spite of the almost total loss of a lucrative wool-spinning and combing business, which employed a vast number of hands, principally females, and also of the hempen manufacture, the condition of the labourer is *greatly* improved. All my correspondents agree in this point; for instance, J. Rodwell, Esq., says, "That the condition of the agricultural labourer has progressed within the present century, may be well authenticated by every unprejudiced inquirer; they are as a class not only better lodged, fed, and clad, but they are generally advanced in intelligence by habits of greater industry, and from the extension of education and religion in every part of this country, and this not only as compared with themselves, but in comparison with the condition of the same classes in other counties. These remarks, however, are more applicable in general to those districts in our county where independent yeomen and large occupations prevail, and more especially where they have the aid of cottage allotments at a moderate charge for rent." In justice to the labourers themselves, it is but fair to give them credit for having amongst their number men who will challenge any county for drilling, ploughing, and draining.

The following articles, the first of which was kindly forwarded to me by J. Peirson, Esq., and the second by Mr. Charles Poppy, will fully show the present condition of the labouring class, in respect to cottage accommodation, wages, &c.:—

"The present condition of the agricultural labourer in Suffolk, when he has constant work and a regular master, is upon the whole satisfac-

tory. His wages vary in some degree with the price of corn, for day-work, from 9s. to 12s. per week. At task-work he would earn more money, and a great proportion of the farm-work is now done by task, such as draining, hedging, ditching, mucking, hoeing, threshing, and haymaking; besides this, his wife earns 6d., 8d., or 10d. per day, and the children 3d. or 4d. per day in the fields, according to age, at certain seasons of the year. The man earns his harvest money, about 6l. for the month. The woman, if employed in getting in the harvest, obtains increased wages; but if not employed, the wife and children would get from six to eight bushels of gleaning corn (wheat). He has generally a garden, and often an allotment of from 20 to 40 rods of land. On the subject of allotments a difference of opinion exists. Some are of opinion that it interferes with the regular work of the master; whilst others think that it tends greatly to the labourers' welfare, as well as to the advantage of the community at large. It is not my intention to discuss this question here; I cannot avoid stating, however, that (dropping the term 'allotment') it is much to be desired that every agricultural labourer should have a large garden; it tends to give him a certain position in society as the occupier of land, and farmers should encourage the feeling of security to the labourer in the continued occupation of his garden, as they feel that their landlords should more fully secure them in their farms.

"The cottage rents are about 3l. to 3l. 10s. I am sorry to say, whilst the average rental of the land in one particular parish that I could mention was about 25s. per acre, the cottage allotments were charged at the rate of 4l. per acre, including rent charge and rates. Painful as this fact is to me, I felt, as a chronicler of facts, I ought to mention it."

Mr. Poppy writes, "I presume the labourers in Suffolk are as well paid as in any agricultural county, and I believe fully as much as the bulk of farmers can afford—10s. per week is the day-wages, but nearly all the work is done by contract; women and boys are paid 8d. per day. Very few are out of employment for any length of time. In such ruinous times as occurred from 1819 to 1823, one-third of the labourers were thrown out of work from the farmers not being able to pay them. Again, in 1834 and 1835, some were out of employment; since then but very few; but if it had not been for the demand for labourers on the railroads, some quantity must have been out of employment; all increase must be surplus."

"The labourer's wife and growing-up children get a good deal of employment on the land during the year, but such employment is but for such periods. The most active of the women gather four bushels of wheat commonly, and others two or three bushels, and the children, according to age, from one bushel upwards: this is a great relief, as the men's harvest-wages go nearly all for rent.

"Up to 1800 it was estimated that 200,000l. per annum was earned in this county by spinning, knitting, and weaving lace; this divided amongst the 520 parishes, gave nearly 400l. for each parish. All these means of earning a livelihood have been cut off, and *the lone women have been paupers ever since*, and the labourers with large

families are in poverty, whilst others spend half their earnings at the alehouses.

"Previous to the old poor-law being altered an allowance of 6*d.* per head for all children above three in number and under ten years of age was made to *reimburse* them in some measure for the loss of the spinning and knitting trades; the alteration of the poor-law prevents allowing for large families, but it has not prevented early marriages. Thus the most industrious poor and their children suffer great distress. The allotment system cannot be adopted to any great extent, and where it is adopted, the unfortunate occurrence of the potato disease has disappointed their hopes and plunged them in greater difficulties.

"Farming is an open trade, we cannot shut our gates and write 'no admittance here;' every one seems to think they know what the farmers ought to do, and blame them for not doing what they think ought to be done, to increase the comforts of the poor.

"Farm servants won't be content to live on the food that farm servants used to have, and more land being in tillage and more employed by extra tillage, few farm-houses are large enough to accommodate this increased number of servants, but many have as many indoor servants as were formerly kept in the house. 'The labourers' cottages are too small;' why, probably not one farmer in ten has a cottage on his land; very few have, at any rate. Landlords will not build cottages, and where a whole parish belongs to one proprietor, cottages have not been built, nor in some cases suffered to be built, nor were the tradesmen suffered to take apprentices; thus cottages were built by tradesmen and others in adjoining parishes. Horse-drivers were hired for a year in one parish and resided in an adjoining parish, and thus gained a settlement; and now the new law has thrown the whole on these parishes, and the gift coals and other charities have to be so divided that none receive any substantial benefit.

"The old clay-walled and thatched cottages (probably most of them were formerly small farm-houses) are the warmest in winter and the coolest in summer, but standing in lone situations, a distance from the shops and village schools, are so far inconvenient, at least in the heavy-land district, where they prevail most.

"The new-built cottages are small, one brick thick generally, and pantiled, and high rents. Here and there we see a cottage, some tradesmen's houses, and there are several farm-houses and premises built with large clay lumps.\* There are many in the clay district by

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\* The clay lumps make excellent dry walls, if placed on a foundation of bricks high enough to prevent the splash from the eaves and rain, and being well protected by a projecting roof. Such walls are stuccoed or tarred.

These lumps, too, serve for temporary kilns to burn drain-tiles; they are far better than common clay walls, as, when not further wanted for burning tiles, they can be removed, and serve as a shed. Clay lumps are not liable to brick-duty; the manner of making them is thus described by Mr. Etheridge, in the 6th vol. of the R. A. S. Journal:—"Clay dug from a pit is mixed with as much sand as it will carry to remain tenacious, say one yard of clay to half a ton of sand, sometimes a small quantity of straw is thrown in, the whole trodden by a horse until it becomes of one con-

the side of the turnpike road from Stonham, in Suffolk, to Stratton, in Norfolk. In digging the clay for a cottage, a pond is made to supply the house."

In that part of the western district where flints are abundant, very handsome cottages and school-houses are built with shaped flints and red or white brick, and either slated or tiled. The corners of the cottages and sides of doors and windows are of brick, and the other parts filled up with flint; the contrast of the dark blue flint with the red or white brick looks exceedingly well. In the north-west corner many cottages are built of clunch, a hard kind of chalk. Reed is much used for thatching cottages, as well as farm buildings, in the western district, and taking all things into consideration, it is probably the best covering that can be used.

The state of education among the poor in Suffolk may be considered as about the same as that of other counties; it is considerably improved from what it formerly was, and no one now need remain ignorant of at least reading and writing.

But though the education of the labourer may be equal as respects intellectual cultivation with other English counties, and his practical knowledge of farm-work far superior to the labourers residing in districts where arable farming is less general than it is in Suffolk, yet further intellectual education would prove of vast benefit not only to the social and moral condition of the labourers, but also to the general agricultural interests of the county; if the labourers received a better education, they would find other sources of recreation than those to be found at the village alehouse—the club-feasts and frolics, where it is a notorious fact that the company indulge in eating and drinking to excess, would be held in less estimation—poaching, the bane of a game-preserving district, would become less prevalent—and the fruit of a sound education would be a class of intelligent labourers deserving of more confidence and of better treatment from the hands of their employers than some of them now receive; and I confidently assert that the labourers would become as worthy of the friendship of

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sistency, when it is thrown into moulds, or wooden boxes, made very strong, 18 inches long, 12 inches wide, and 7 inches deep. When removed from the box they are left to harden partially, and are turned constantly on their ends and sides, so as to dry straight; when nearly dry, are piled in stacks until required for use. These lumps are always made on the spot where they are used, on account of the expense of carriage.

The box or mould is made of deal 2½ inches thick, and well bound round the corners with hoop-iron; the bottom and top edges are also cased with iron to prevent their wearing.

In Norfolk, Suffolk, and Essex these are made at from 5s. to 7s. per hundred: Walls are built at 10d. and 1s. per yard square (or 9 ft.) 1 foot thick, including the pinning and foundation.

their masters as the intelligent tenant is of the friendship of his landlord.

In Scotland the result of practical information is well known; and, as stated at a meeting of one of our Farmers' Clubs, the Scotch ploughmen, as a class, are as capable of cultivating the soil of Scotland as the farmers themselves, and this statement is authenticated by the great demand in the English labour-market for Scotch ploughmen and Scotch bailiffs. If our labourers received the same sound education as those of Scotland, they would, in their progress through life, be as anxious to increase their stock of information; and, as a reward for their studies, I have no doubt the demand which already exists for bailiffs, ploughmen, and drill-workers from Norfolk and Suffolk, would be equal and probably superior to the demand now existing for Scotchmen. I can say this much for the Suffolk labourers, that wherever I have been I have never seen their skill as ploughmen and drill-workers surpassed, and very seldom equalled; and it is merely the want of education which debars them from filling situations for which they are in other respects well qualified. Alteration in the laws of our country and the easy access which railways have given to distant parts, will render the labour-market open to all, and if the labourers of my native county have any wish to improve their condition, I would strongly advise them to exert every effort to obtain knowledge, to place more dependence upon their own exertions, and less dependence upon their employers and upon parish relief.

As to the manner of living, this also, as resembling that of the neighbouring counties, requires little to be said of it; it may, however, be noticed that Suffolk and Norfolk "dumplings," whether hard or yeast, are proverbial; and Suffolk or "flet" cheese formed a great portion of the food of the labouring class formerly, but not nearly so much now, on account of the disuse of dairying; and beer, generally sharp, the favourite beverage; and it is a curious fact, that the common drink in almost all places is preferred sharp or acid; as the common cider in cider counties, the vin ordinaire in France, &c.

In regard to paying wages, many farmers pay them on some other day than Saturday, as Friday for instance; this seems a small matter, but it adds much to the comfort of their families, and prevents much Saturday night and Sunday drunkenness.

The provident societies, as benefit, clothing, and medical clubs, are numerous in Suffolk, and these, with the addition of savings-banks, tend to promote the well-being and happiness of the labouring class. It is necessary that these clubs should be under the control of the clergyman, or else abuses are very apt to rise.

*Benefit Clubs.*—In Young's 'Report,' published nearly 50 years ago, more than 200 benefit or box-clubs are mentioned as existing



in Suffolk, and they are certainly not *decreased* since that time. These clubs are generally small local ones, established by 30 or 40 men, for allowing money and the aid of a medical man in time of sickness. The club meets once a month at a public-house; the subscription of the members 1s. 6d., of this 6d. is spent immediately for a quart of beer for each man. At Christmas a frolic takes place, often lasting two days or more, and many of the members are eating and drinking all this time. The allowance to a sick member is about 8s. a week, and a certain sum for his burial, at which all the members attend. No member is allowed to work in any way during the time of receiving an allowance from the club, and should he even be seen to work in his garden he will be expelled. Such are the regulations of some of these clubs; and this is not all, for we often hear of one or other becoming bankrupt. I have mentioned these abuses of the *small* clubs held at *public-houses*, but when the clergyman takes the management of them, or the club is a branch of a large organisation, as the "Odd Fellows' " Society, these objections are obviated. In the medical clubs 1d. per week is generally paid by each member of the family, for which the doctor attends and finds medicines in all cases except midwifery, which is 7s. 6d. extra.

In the clothing clubs they subscribe a few pence weekly, which is returned at Christmas, with some additions from the clergyman, landlord, &c., and are also assisted in obtaining clothing at a more wholesale price.

In many parishes we have subscriptions for buying coal and retailing it out at a reduced price to our poorer neighbours; this relieves their distress without lowering their feelings so much as if entirely a gift.

Mr. Poppy has spoken of the large amount formerly earned in wool-spinning, &c. To show the present fallen condition of this trade, I shall mention that there are still two or three woolstaplers at Lavenham, who employ between 600 and 700 spinners; these reside in the surrounding parishes of Brent and Monks Elergh, Shimpling, Cockfield, Rattlesden, and other neighbouring villages. One of the staplers, Mr. Turner, employs about 300 spinners; he pays at the rate of 13d. a lb. for what can be done by machinery for about  $\frac{3}{4}$ d.; the spun yarn is principally sent to Dublin, to be worked with silk into that description of stuff called tabinet. The trade is, however, much on the decline, and in all probability will be relinquished altogether in the space of a few years: the earnings made by the spinners are but trifling at the present rate of 13d. per lb., for a woman who has to attend to the other business of her house, does not spin more than 2 lb. a week: formerly the price was sometimes as high as 5s. per lb.

*Local Words in use among the Labouring Classes.*

To give a complete list of all the provincialisms in use in Suffolk, would not only take up too much space (volumes having been written on the subject), but would also be unsuitable to an Agricultural Report; but to give a list of the local words and phrases relative to agriculture only will be useful, both as explaining the provincialisms which have necessarily been used, or may unawares have slipped into this Report, and also as explaining to any stranger who may enter the district the peculiar agricultural phrases which would otherwise completely baffle all his ideas on the subject; these provincialisms may also be found useful in explaining peculiar agricultural practices which could not properly be placed under any other head. So far I think they may very properly form a portion of an Agricultural Report, not that such a list would be required in every report, the same local dialect generally extending over several counties. Thus this present list would serve for Norfolk as well as Suffolk, the main difference between the two counties being that the Suffolk people have a peculiar sing-song manner of speaking generally, called the "Suffolk whine." There is but little in this list that is original, most of it having been extracted from the very full collection of "lingual localisms" contained in Major Moor's 'Suffolk Words,' and Forby's 'Vocabulary of East Anglia,' and more particularly from the former work.

*Aftermath*—feed left on meadows after being mown. Tusser has it, as also Rowens.

*Allen or Ollands*—grass land lately broken up; quere, *ald-lands*.

*Anberry*—knobs or excrescences on turnips and other roots, caused by the punctures of insects to deposit their eggs.

*Avel*—the awn or beard of barley; and avel or havelling machines are used to remove these avels or havels.

*Avelling Work*—reapers or mowers approaching the side of a field not perpendicular or parallel to the line of work will have an unequal portion, to do the excess or deficiency of which is called "avelling," or sometimes short work; quere, *eave-long*.

*Bail*—the bow of a scythe; also the handle of a pail, bucket, or kettle.

*Baffled or Buffled*—growing corn or grass is baffled by wind and rain.

*Backstriking*—a mode of ploughing in which the earth, having been previously turned, is turned back again. As Tusser says—

"Thresh seed and to farming, September doth cry,  
Get plough to the field and be sowing of rye;  
To harrow the ridges ere ever ye strike,  
Is one piece of husbandry Suffolk doth like."

*Balking or Balk-ploughing*—a particular mode of ploughing land for fallow, whereby it is laid in ridges or balks. In this mode the land is not all stirred, a portion is passed over; the portions so left are called balks.

**Balk**—an untilled strip, a yard or so wide, left between two occupiers or properties, often crooked.

**Balk**—the contrivance in our neat-houses for confining the cow's head while being milked. "Bawk up" is the command readily obeyed by the obedient creatures for thrusting their heads into the balk, which is composed of an upright piece or beam, fixed in the floor and to the top framing; of a second piece of the same length and size, and when upright about a foot apart from and parallel with the other. It moves on a pivot in the floor-frame, and when released from its "top-latch" or catch falls in the framing, so as to form an angle of about 35 or 40 degrees with the "right up." As soon as the cow has adjusted her head between these two pieces, the inclined one is pushed to the left by the milkmaid to the perpendicular, and having its top edge duly bevelled it raises a latch which falls over and retains it in that position, allowing the animal a free up and down but no lateral liberty. When done with, the latch is lifted, the moveable piece falls to its limited inclination, and the animal is free. Major Moor gives this account so minutely, because he says he has never seen so simple and effectual a mode practised in any other part of England. The number of balks is equal to the number of cows, and they are a yard or so apart.

**Bang**—Suffolk cheese, made of milk several times skimmed, therefore very hard and tough, otherwise called Suffolk thump. Bloomfield, in his 'Farmer's Boy,' has well described our Suffolk flet cheese, "whose very name alone eugenders smiles." It is, as he says, "the well-known butt of many a flinty joke." There is hardly a writer on the subject but has his fling at it; and the only merit allowed it is that of keeping well, and consequently being the best sort for ships' stores. As Suffolk folks get the benefit in the butter, they are quite ready to join in the laugh against this product of their "three-times skimmed sky-blue." The following are some of the jokes on this subject:—"Hunger will break through stone walls, or anything except Suffolk cheese," is a proverb from Ray. Grose says, "Suffolk cheese, from its poverty, is frequently the subject of much humour. It is by some represented as only fit for making wheels for wheelbarrows; and a story is told, that a parcel of Suffolk cheese being packed up in an iron chest and put on board a ship bound to the East Indies, the rats, allured by the scent, gnawed a hole in the chest, but could not penetrate the cheese." Moubray says, "The Suffolk bang is only fit to be cut up into gate-latches, a use to which it is often applied." The following *elegant* couplets are very current in the county:—

"Those who made me were uncivil,  
For they made me harder than the devil;  
Knives wont cut me, fire wont sweat me,  
Dogs bark at me, but can't eat me."

**Batlins**—the lopping of trees for firing, hedging, or hurdles; tied up in faggots they are called bavins.

**Barth**—a shelter for catle, &c.; quere, berth.

**Bay**—the space between the threshing-floor and the end of the barn.

**Beestins**—first milk after calving; not fit for use.

**Beezlings**—third or fourth milk after calving, particularly sweet and good, and considered strengthening by rustics.

**Bents** or **Bentles**—dry stalks of grass remaining in pastures after summer feeding. The following rhymes are common:—

"The dow (dove) she do no sorrow know  
Until she dew a-bentin go"—

*i.e.* till she is forced to feed on seedling bentles, all other food failing.

"When the pigeons go a-benting,  
Then the farmers lie lamenting."

**Bigg** or **Barley-big**—*hordeum hexastichon*; a kind of barley a good deal cultivated in the fenny districts. It yields and grinds well, but will not malt. The Scotch big, according to Jameson, is *hordeum tetrastichon*.

**Bottle**—a moderate quantity of hay or grass, such as may serve for one feed, twisted somewhat into the shape of a bottle. Barley-bottles were also formerly used. These were little bundles of barley in the straw given to farmhorses. This wasteful mode of giving feeds of corn is probably nearly, if not quite, disused. (Forby.)

**Brand**—the smut in wheat, making it look as if a hot iron had passed over it.

**Brank**—buckwheat. Tusser has this word.

**Brawn**—a boar.

**Breck**—a large division of an open corn-field; sometimes break.

**Brakes**—ferns. Tusser also has this word.

**Broaches, Brauches**—rods of willow hazel, or other tough and pliant wood, split, sharpened at each end, and bent in the middle like a hair-pin; used by thatchers to pierce and fix their work. A fell of such wood is divided into hurdle wood and broach wood.

**Bole**—is the stem, trunk, or "right up" of a tree. In like manner, the large branches are *wrongs*; smaller ones, *chatter bushes*; lower small branches, *washboughs*; crooked parts, *crotches*; short projecting stunted shoots, "*spars*" (spurs); knots, "*biests*;" the bark, "*pill*;" branches lopped off, *stowins*.

**Bout**—a turn in ploughing; thus "4 bouts to a yard" means that the plough turns over 9 inches in width in each furrow.

**Bridle**—the head of a plough.

**Brush**—to brush is to cut down with an old scythe or brush-bill nettles, &c., in hedges; a brush-bill is a long-handled implement, with a curved iron blade for brushing fences.

**Buck**—the body of a cart or waggon.

**Buckheading**—cutting down live fences to within 2 or 3 feet of the ground, perhaps from a supposed resemblance of the jagged and forky ends to antlers. In Norfolk it is called *Buckstalling*. It is not good management of fences to buckhead them.

**Bud**—a yearling calf, perhaps from the horns then beginning to bud. Calves, male or female, are called *buds* while between one and two years old; the female then becomes a heifer, and after having a calf she becomes a cow. A bull-calf we also call a *bull-kin*, a *teu-year-owd* bull, a *three-year-owd* bull, &c.

**Bungtailed, Bunged, Bung Dock**—a cruel custom of cutting a draught-horse's tail off, and searing it close to his dock. Not often, I may say never, seen now.

**Callow**—the stratum of vegetable earth lying above gravel, sand, limestone, &c., which must be removed in order to reach them. The process is called uncallowing; a Norfolk word.

**Camether**—to order the leading horse of a team to turn to the left. Equivalent to *heit*, as *heit brock*, *heit scott*—Chaucer has this expression. As horse-drivers generally walk on the left side of the team, this word was probably *come hither*; but now it has no reference to approach, as it is used indiffer-

ently from the right or behind, more generally *Woo-kum harther*. *Re-e-e* or *wooo r-e-e-e*, with a lengthened shake, turns the leader to the right.

*Ge-wo* or *Ge-ho*—tells our draught-horses to go on.

*Car*—a wood or grove on a moist soil, generally of alders.

*Capperd*—cream is *capper'd* when, from heat of the weather, or impurity of the vessel, it coagulates, and will not readily mix with tea. Windy weather is said to produce this effect.

*Caving*—the chaff and broken ears of corn swept from the threshing-floor; a *caving* sieve is a large sieve, with wide spaces to keep these in, and let the grain through.

*Cauk*—calcareous earth; in general, any sort of limestone, calc. In very many parts of Suffolk and Norfolk there are quarries of it, some of great size, which have been worked many centuries. It is of various qualities, from a loose friable marl to a close-grained building-stone. It has been proved to be very firm and durable in many modern buildings, where due care has been taken to lay it as it was in its native bed; otherwise it soon scales off in laminæ, or even splits through its whole substance. But the great proof of its durability is afforded in the ruined walls of some of our monastic buildings (of which it forms a considerable part), where it has been exposed near three centuries to the action of the elements; and whence much of it has been taken in a sound state to be used in new erections.

*Chobbins*—unripened grains not coming out of the husk under the flail, but beaten off by it; quere, choppings.

*Chobby*—abounding in chobbings.

*Clipper*—a shearer of sheep, a clip of wool. Sheep-clipping is a much more common expression in Suffolk than sheep-shearing. The word shear is with us more applied to the reaping of wheat, or other grain, with the sickle.

*Clogwheat*—a bearded variety of wheat, in Mark Lane called rivets.

*Clunch*—a close-grained, hard limestone, fit to be used in building, but soft when first taken from the quarry.

*Cob* has various meanings—1. A compact, punchy kind of horse. 2. A basket used in carrying chaff, or, as Moor has it, for broadcasting seed-wheat, *seed cob*, *seed lib*. 3. *Cobs* of clover are the seed-heads, and *cobbing* is threshing.

*Colder*—broken ears of corn mixed with short fragments of straw beaten off by the flail, and separated from the chaff and corn by the *caving* sieve.

*Cosh*—the glume of corn, particularly wheat. “White wheat in a red *cosh*” is a favourite variety. Clover-seed in the husk is termed *cosh*.

*Cossett*—a pet, a *cossett*-lamb, a lamb reared without the ewe.

*Crag*—the masses of marine shells, both bivalve and univalve, common along the coasts, and for eight or ten miles inland of Suffolk imbedded in sand. A cragpit is a valuable thing on a heavy-land farm; decomposed shells and the sand act, both chemically and mechanically, on the soil on which it is spread, but it is wrong to mix it with farm-yard manure, as some do.

*Croft*—a small meadow or pightle near the house.

*Crome*—a staff with an iron hook, with two or three prongs at the end, as a *muck-crome*, a *turnip-crome*, a *mud-crome*, &c.

*Crudburra*, *Kudburra*—a wheelbarrow.

*Dag*—the morning dew.

*Daabing*—a particular mode of making walls of cottages and farm-buildings

with a composition of clay, a little lime and straw well mixed, or of daubing this composition over lath, hazels, or any sticks with small interstices. It is very durable, lasting forty or fifty or more years. "There's craft in daubing," or, as Ray explains, "There's more craft in daubing than throwing dirt on the wall," means even in daubing some skill may be shown.

**Darnaks**—a thick leather hedging-glove, made whole to grasp the thorns, and worn on the left hand only.

**Deal-apple**—the conical fruit of the fir-tree, used for firing.

**Didall**—a tool mentioned by Tusser; some say it is the cromed draining-tool, others a triangular spade as sharp as a knife.

**Diddles, Diddlings**—young ducks or suckling pigs.

**Dills**—the paps of a sow; "a pig to every *dill*" is a good character for a store or breeding sow. "More pigs than *dills*" is said of a large family with small means, in a figurative sense.

**Dool**—a boundary mark in an unenclosed field. It is very often a low post, thence called a *dole*-post.

**Double Tom Plough**—a double-breasted plough used in drawing water-furrows, landing up potatoes, turnips, &c., in drills or ridges.

**Drift**—an iron bar used for *driving* holes, in setting hurdles; a narrow strip of pasture used as a driftway.

**Dropping**—the operation of *dropping* grains of wheat, peas, or beans into holes made by the *dabs* or *dibbles*. *Droppers* are always women or children; and, as the *dibbler* generally takes the job by the acre, the earnings of a family at this work are considerable. It is surprising with what quickness and accuracy *dropping* is executed by a good *dropper*. One will sometimes carry three holes at once, children seldom more than one hole; such portion of work is called a *rocket*—"that is *yar rocket*."

**Drug**—a strong carriage with four wheels, for conveying heavy loads of timber. It has nothing to do with dragging.

**Dutfin**—the bridle in cart-harness.

**Earnest or Arnest**—is the sum given by a master on hiring a servant, *ls.* generally; it is still a notion that if *earnest* is not given or taken, it is not a complete bargain, no proof of the parties being in *earnest* perhaps.

**Earth**—one ploughing; so "two *earths*," "three clean *earths*," &c.

**Eddish**—a crop taken out of due course is called an "*eddish*" crop, or a stolen crop. Bean *eddish*. Tusser calls it *etch* as well as *eddish*:—

"Where wheat upon *eddish* ye mean to bestow,  
Let that be the first of the wheat ye do sow;  
White wheat upon peas *etch* does grow as he would,  
But fallow is best if we did as we should."

*Eddish* also means *aftermath*.

**Ether and Ethers** (rhyme to whether)—the operation of running a line of hazle or other flexible wands intertwiningly along the top of a hedge, to keep it more firmly within the hedge-stakes. "Mind you *ether* it right strong." To "bond" a hedge has the same meaning.

**Ewe** is generally pronounced "*yowe*," as in Scotland. Besides the names ram and ewe, which are common everywhere, the male, while young and in use, is called a *tup*, a name almost equally common (see Shakespeare's 'Othello'). Male lambs, as soon as castrated, are widders; they keep this name through life. Hog and hoggett distinguish both sexes in their second

year till after their second shearing. One shear, two shear, and three shear also denote their ages. Shearlings mark the period between the first and second shearing, or clipping, in both sexes. *Crone* is the name of the breeding ewe after she has had lambs and lost her teeth; this name she retains through life. When their teeth get bad, or they have lost them, and are no longer fit for the breeding flock, they are called *ovd-crones*. Some say it is the loss of teeth which marks the *crone* in either sex. *Wedders* is evidently only another pronunciation of wethers, also in use with us. Yearling lambs, such as are intended at a year old to be fatted for the butcher, are called *dans*; quere, *d'an*. Farmers, who buy these lambs at August or September fairs, and sell them in the following spring or early in the summer, are said to *dan* them.

*Ewe*—white *ewe* is a shelly kind of earth in the fens.

*Eze*—an ax; a *hump-eze* is a wood-riving and tree-felling axe, longer and narrower in the blade than the common.

*Fare* or *Farrow*—a litter of pigs, the smallest of which is generally called the "*pitman*;" a sow *farrows*, a sheep *yeans*, a cow *calves*, a mare *foals*, a bitch *whelps*, a rabbit *kittles* or *kindles*.

*Farmer*—a term of distinction commonly applied, in Suffolk, to the eldest son of the occupier of a farm. He is addressed and spoken of by the labourers as "*the farmer*." The occupier himself is called *master*. A labourer, speaking to the son, would say, "Pray, *farmer*, do you know where my *master* is?" Or one labourer would ask another, "Did my *master* set out that job?" And would be answered, "No; my *master* didn't, but the *farmer* did."

*Fill-bells*—the chain *tugs* to the collar of a cart-horse, by which he draws.

*Filler*, *Thiller*, *Thilhorse*—the shaft-horse of a cart or tumbrel; he remaining while it is filling, the other horses being taken off to draw the filled cart. In a regular waggon-team the horses are called *forehorse*, *forelash*, *hand-horse*, and *filler*; a set of *thiller's gears* is the harness for this last horse.

*Flag*—1. a portion of the surface of heathy land turned up by the spade, and heaped to dry for fuel. The more it abounds in roots of ericæ, &c., the better fuel it makes.

2. The surface of a clover lay of the second year, turned up by the plough. The wheat for the next year's crop is dibbled into the *flag*.

*Flash*—to flash a hedge is to cut off the lower parts of the bushes which overhang the bank or ditch.

*Flecker'd*—variegated of two or more colours, descriptive of domestic poultry. Gah (*gay*), pied, or piebald, shell, and speckled, mean nearly the same, but are not in every case interchangeable. Shell is descriptive of a species of duck. A horse with much white about him would be called *piebald*, and, I think, *fleckered* if in small patches. A cat is never either *fleckered*, *pied*, or *shelled*; she may be gay, as a variegated cow would be.

*Fleet*—a shallow piece of standing water; when deep, a *mere*; when very shallow and only a collection of wintry wet, *splashes*.

*Flet* milk is milk skimmed or *fletted*; the cheese made from it is called *flet-cheese*; and the *fletting* implement a *fletting* dish or *skillet*.

*Flick*—the outer fat of the hog which is cured for bacon.

*Flip*—a favourite potation, composed of beer, gin, and coarse sugar, the principal ingredient at harvest suppers. It is to be lamented that, since gentlemen have turned farmers and farmers gentlemen (which both perhaps begin to repent), these scenes of harmless jollity have in too many cases been shifted from the farmhouse to the alehouse.

*Fog*—grass not fed down in the latter part of the summer and autumn, but allowed to stand through the winter, and yielding early spring feed. By its length and thickness the outer part forms a cover or sort of thatch for the lower, which is kept fresh and juicy, at least through a mild winter; also applied to coarse sour grass that cattle will not eat till it is frost-nipped a little, else left on the pasture.

*Foison*—succulency, natural nutritive moisture, as in herbage. Ex.: "there is no *foison* in this hay;" *foisonless* is devoid of *foison*.

*Foky*—bloated, unsound, soft, and woolly. Ex.: a "*foky* turnip."

*Footing*—a fee, present, or fine, to be paid or given to fellow-workmen on a novice commencing any business. "*Shoeing the cowt*" is an expression of like meaning with paying his footing.

*Freemartin*—twins of different sexes, or rather the female of twin calves. It is generally known in Suffolk that the *martin* will not breed; both of a sex prove fertile.

*Fringel* or *Swingel*—that part of the flail that falls on the corn, the other is the *hand-staff*.

*Frosted*—the operation of turning down the hinder part of horses' shoes in hard frost to prevent slips.

*Frummety*—wheat boiled in milk with cinnamon and sugar, an excellent dish; a saying recommending precaution runs thus, "When ta reen frummety, mind ye heent a dish to seek." Tusser mentions "The seed-cake, the pasties, and furmenty pot."

*Gall*—a vein of sand in a stiff soil, through which water is drained off and oozes at soft places on the surface, otherwise *sand-galls*.

*Gang*—among farmers those people employed by an "undertaker" are called a *gang*. We also say a *gang* of harrows.

*Gast* or *Ghast* cow—a cow not *seasonably* in calf.

*Gavel*—to gather mown barley, or oats, or hay, with hand-rakes into rows and small loose cocks ready to pitch into the waggon. The persons, generally women, who do this are called *gavellers*, and the corn in such rows is said to lay on the *gavel* or in *gavels*.

*Goaf*—a rick of corn in the straw laid up in a barn; if in the open air, it is a stack. The *goaf-flap* is a wooden beater, to knock the ends of the sheaves, and make the *goafer*-stack more compact and flat. In Suffolk, the *goaf-flap* is seldom or never used; but it is a standing joke on the 1st of April, to send a boy or a silly fellow to borrow a *goaf-flap*, and the messenger invariably "runs the gauntlet" of all the servants and labourers at the farm-house to which he is sent. To *goave* is to stow corn in a barn. *Goaf*-steads are the divisions of the barn in which these are laid. The threshing-floor is called the *middlestead*.

*Grist* mill—a mill which grinds small portions for customers, and takes a *grist* for its fee.

*Grope*—in remote country villages there is (or at least was) a person, generally an old woman, exclusively possessing the secret of determining whether or not a goose were duly impregnated. To this end she gropes in a peculiar mode with her finger; the operation is called *groping*. A trick, sometimes played on the sapient beldame, was palming a gander in lieu of a goose, and listening to her sage remarks. Ray has a proverb, "Teach your grandame to *grope* her ducks."



*Gyle Wort*—*gyle* vat or *gyle* tub—the vessel in which wort is fermented.



**Hackle** or **Shackle**—the fastening, usually made of hair, with an eye at one end and a toggle at the other, round the fetlocks of a cow, to prevent her kicking when being milked.

**Haggy**, adj.—applied to the broken and uneven surface of the soil when in a moist state. Were it dried and hardened by sun and frost, it would be *hobbly*.

**Hake**—the dentated iron-head of a foot-plough, serving to adjust the depth to which the land is to be stirred.

**Handles**—the handle of a knife or other small tool is called a *haft* or *heft*; of a hatchet or axe, *helve*; of a flail, *handstaff*; of a spade, *shuppatt*, or muckfork, *tiller*; of a rake or long fork, *stale*. There are two sorts of *tillers*; a *scuppatt* and *shaffell* have a cot-tiller, tenanted on the top for a handle ; a spade, an *eye-tiller* , of one piece. Scythe-stick, sometimes called *sneath* or *snathe*; a *swake* is the handle of a pump; *sheath*, the handle of a long pitchfork. *Stock* is also the holding part of other things besides a gun; thus we have whip, *stawk* or *stock*.

**Hay**—a hedge, more particularly a clipped quickset hedge.

**Haynet**—a long, low net, say 30 or 40 yards long, by 1 yard high, placed upright by stakes along hedges, or in slays cut through whin covers, &c., to prevent the transit of rabbits from side to side when hunted by dogs.

**Haysel**—hay harvest.

**Haulm** (*Hahm*)—the stubble of wheat; it is raked together in heaps by women, generally at 16d. or 18d. per acre. If done before it be a little frosted, it is man's work, as the roots, not having perished, do not easily come up. This haulm is made into excellent walls for farm-yards, say about 8 or 9 feet high, and 4 or 5 feet wide at the bottom, which are warmer than any other walls can be. With the addition of hurdles, very warm pens and folds are also made for ewes at lambing time. The stalks of potatoes, peas, and beans are also called haulm; and the runners of peas and strawberries are called risps.

**Haze**—land drying after having been turned up by the plough is left to *haze* before it be harrowed, or a stiff clay dry bank is not fit to be patted smooth with the back of the spade till it has "*hazed*" a little after being wetted with rain.

**Head-man**—the chief hind on a farm.

**Highlows**—an expressive name for the strong *anklejacks* worn by labourers, being too low for a boot, and too high for a shoe; both the use and name of this kind of shoe appear rather old, as Fuller, 1660, mentions some of the Suffolk clowns as a *low* parted kind of people, with nothing *high* about them but their shoes.

**Hobble**—a hog's *hobble* differs from a sty, as it is not a place for fattening or breeding; but a lodge with a door for swine to run in and out at pleasure. A horse is *hobbled* to prevent his straying or doing mischief; a hind and fore foot of the same side are connected by a rope or thong. When feet of different sides are so brought somewhat closer together, it is "*yangled*." The expression "*getting into a hobble or scrape*" seems to come from this practice.

**Hobby**—a small horse, a pony.

**Hodding Spade**—a kind of spade principally used in the fens, so shaped as to take up a considerable portion of earth entire, something like a hod.

**Hounce**—the ornament of red and yellow worsted spread over the shoulders of horses in a team.

**Hoven**—swollen. Cattle are *hoven* by eating too much green clover, &c., in a moist state. Turnips are *hoven* by rank and rapid growth in a strong wet soil.

**Howes**—time of oats coming into ear. Fleas are considered particularly stirring and troublesome thrice a year, at oat sowing, oat *howing*, and oat mowing.

**Hulver**—holly. Tusser says—

“Save elm, ash, and crab tree for cart and for plough,  
Save step for a stile of the crotch of the bough,  
Save hazel for forks, save fallow for rake,  
Save *hulver* and thorn thereof flail to make.”

Holly and whitethorn, for their hardness and heaviness, are still esteemed for the swingel of flails, as is also “sallow for rake.”

**Hurdles** are of various kinds—sawn; *rift*, i.e. split or riven; and *wan* or *wattled*, these last twisted of hazel wands.

**Jet**—a large ladle affixed to a long handle to empty cisterns, &c., as “brewer’s *jet*,” “swill-*jet*,” &c.

**Jim**—a machine composed of an axle, two wheels, and a pole, for moving timber under it. With four wheels the timber is laid on, and it is called a *drug*. In Norfolk the *jim* is called *jill*, and the *drug* *jack*.

**Joss**—a command to a horse to sidle up to a block or gate, that the rider may the easier mount. Such a block is called a *jossing* or *jostling* block, and was formerly seen near the door of most farm-houses, with three or four steps leading to its top, and railed in on two sides. These conveniences have fallen into disuse, with the *pillion*. *Jostle* is the word used to a cow when milking, for a similar purpose.

**Journey**—a day’s work at plough; the same as a “yoking.” One *journey* a day is when the horses do their whole day’s ploughing at once, working about eight hours, and leaving off at half-past two; two *journeys*, working for nine hours a day, leaving off work at noon and resuming it at two o’clock.

**Kelter**—condition, order. A farm may be said to be in pretty good *kelter*; a plough is said to “*kelter*” well or ill according as it works sideways, or out of the direct line of draught.

**Knacker**—a saddler and harness-maker. Sending one for “a pennorth of *knacker’s* brandy,” alias *strap-oil*, is a favourite joke on the 1st of April.

**Lanyer, Lanner**—the lash of a whip, not including the whipcord.

**Lash or Lashy**—wet, as applied to a meadow, indicative of the quality of the feed, causing young cattle to be *lash*. Very young clover or very early feed on wet pasture is said to be too *lash* for cattle. Autumnal grass is *lash* for horses, or makes them *lashy*, i.e. acts as an aperient. Tusser’s cure for cow-flux or *lax was*—

“Seeth water and plump therein plenty of sloes,  
Mix chalk that is dried in powder with those,  
Which so if ye give with the water and chalk,  
Thou makest the *lax* fro’ thy cow away walk.”

**Lep or Lepe**—a large deep basket, seed-lep, &c.

**Lift**—a gate which, having no hinges, is lifted into holes in the *lift* posts. A *lift-gate* is a compound of a *lift* and gate; it swings on hinges or joints, and is lifted into holes or niches in the clapping-post. A *lift* or loop of pales is the quantity between two posts.

**Lop**—top and *lop* are all parts of the tree except the measured timber. *Slop* is the underwood of a grove.

**'Lowance** or Allowance—the beer allowed in harvest-work and haymaking. The name "*fourzes*" and "*elevens*," given to these short periods of rest and refreshment, show when taken; *dockey*, any hastily-taken meal; *noonins*, the dinner of reapers, sometimes taken at noon, but more generally at 1 P.M. *Bever* is a drink generally taken at 4 P.M. *Trailing-beer* is a donative to labourers of money usually during or before hay-harvest by any one who has passed or is passing over the growing grass, as it makes the crop in that part more difficult to mow. Commonly asked and given in reference to the desired preservation of such partridges' nests as may be met with scythe in hand.

**Make**—an instrument of husbandry with a long handle and a crooked iron at the end, chiefly used to pull up peas. Tusser calls it a "meake." We call the tool pea-make, and talk of "making" the crop of peas.

**Malt-combs**—the little sprouts and roots of malted barley, withered, turned dry, and separated by the screen. The "combs" are used as cattle-food. The malt-dust or minute portions that fall through and mix with the ashes for manure.

**Maul**—clayey or marly soil, adhering to the spade or ploughshare.

**Maukin**—a scare-crow made of old ragged apparel, male or female, set up on new-sown land.

**Maulmy**—clammy, adhesive; sticking to whatever comes in contact with it.

**Meal**—as much milk as is taken from a cow at one milking. Won-mil cheese, a better sort of cheese, made of unskimmed milk and at one meal.

**Meslin**—a mixture of the flour or meal of different sorts of grain. In the 'East-Anglian Vocabulary,' published in 1830, it is said that "*meslin* bread is bread made of mixed flour or meal, and that fifty years ago, on the light soils of Norfolk and Suffolk, thousands of acres produced only rye, which now yield an abundance of wheat. At that time the household bread of the common farm-houses of those districts was made of rye. *Meslin*-bread, made of equal quantities of wheat and rye, was for the master's table only. It was thought very good and wholesome bread. In the seasons of scarcity, within the last thirty years, mealin was made of rye-meal and barley-flour, and the bread composed of it was found to be palatable and nutritious.

**Middlestead**—the compartment of a barn which contains the threshing-floor; generally, but not always, in the middle of the building.

**Milk-broth**—gruel made with milk and grits, or oatmeal, formerly much used in the Houses of Industry.

**Mouse-hunt**—the stoat; the smallest animal of the weazel tribe, found in stackyards and cornstacks, and a favourite with the farmer.

**Muck**—the fresh dung of animals, horse-muck, pig's-muck, &c.; also the same mixed with straw for manure, as *muck-heap*, &c.

**Mud-croom**—a small crooked tined fork, used for removing pieces of turf, &c., in draining land.

**Muggy**—gloomy and damp, "*murky*." A *mug* is damp gloom, neither rain nor fog, but insinuating itself even into stout garments, something like what is called a Scotch mist. A *roke* is a fog of various degrees of intensity; a *smur* is a small drizzling rain.

**Multer**, "Moulder"—land is said to be laid to *multer* when it is laid in ringes, exposed to the air and frost, that it may become pulverized.

*Nickled*—beaten down and intricately entangled, as growing corn or grass by rain or wind.

*Oat-flight*—the chaff of oats, so called from being much lighter than that of any other kind of grain; used by the poor for stuffing beds, and superior to straw, as being more easily stirred and shaken.

*Off-corn*—light grain, not fit for market, seed, or grinding, used for poultry, &c.

*Overwart*—to plough overwart is to plough across or at right angles to the former furrows.

*Pack-gate*—a gate through a pack-way, which often lies through enclosed grounds. Many of such ways and gates still retain their names and uses in High Suffolk. A *pack-way* is a narrow way by which goods could be conveyed only on pack-horses.

*Page*—the lad attending on a shepherd.

*Pan*—the hard earth below that which is moved by the plough. To *pan* is to be hardened, as the surface of some soils is, by strong sunshine suddenly succeeding heavy rain.

*Pane*—a regular division of some sorts of husbandry work, as digging, sowing, weeding, &c. Some pieces of land are called saffron *panes*, from saffron having been grown there.

*Par*—an enclosed place for domestic animals, for calves perhaps in particular. *Par yard*, the farm-yard.

*Paved*—turned hard, as a clayey soil in dry weather.

*Ped*—a pannier, a large wicker basket with a lid. Two are commonly used, and called a pair of "*peds*," one on each side of a horse, in which pork, fowls, butter, and eggs are, or rather were, carried to market, and fish hawked about the country. On the top of the equipoised load a broad seat is afforded for the rider. Tusser mentions the word *ped*. Farmers' wives formerly went to market with *peds*, but none now, nor for a long time. Even *pedlers* or higlers, who seem to take their name from this article, have disused it.

*Pelt*—a sheep's skin with the wool on. *Pelt* wool is the wool shorn from the hide after the animal's death.

*Pie*—heaps of potatoes, or beet, covered with straw and earth to protect them from frost, the same as clamp.

*Pitchfork*—the long two-tined fork, by which corn and hay are put into waggons; the men are called pitchers, and those who unload the same into the stack or goof unpitchers.

*Plash*—to cut down a quick fence when grown old and stubby, and intertwining some of the lower branches. It includes also the operation of out-hauling the ditch and heightening the bank.

*Pleaching* is taking a branch of whitethorn brought down and laid horizontally in a fence to thicken a weak point. It is notched at the point of contact with the earth, which is loosened to encourage the pleach to strike root, and to which it is kept fixed down by a hooked stick or peg.

*Pritch*—a heavy pointed iron for making holes in the earth for fold-stakes.

*Poller, Pollen, Pollinger*—a pollard-tree.

*Queach*—a plat of ground adjoining arable-land, left unploughed because full of bushes and roots of trees.

**Quick**—young white and black thorn (haw and aloë) for making a live fence, often called *spring*, as is also young whins or furze.

**Quicks**—the roots of grass, principally triticum repens, harrowed out of foul land; they are commonly collected in heaps, and burned on the land. Couch, squitch, twitch, and spear grass are other names of this weed.

**Raft, Raftiness**—a peculiar kind of mist. The air is said to be "*rafty*" when it is misty, with an unpleasant smell. If it be, moreover, cold, it is said to be "*raw and rafty*."

**Ranny**—the shrew-mouse.

**Rein**—to droop the head as ripe corn. Barley is also sometimes said to bridle.

**Relly**—a sieve with very large interstices, or made of wood, for *relying* carrots, &c. in, to clean them for horses, &c.

**Resp**—carrots are too resp for cattle when just taken up with all their moisture, and are more wholesome when a little *chung*. Green clover, when recently cut, is also too *resp* for kine.

**Riddle**—a coarse sieve, as a corn-riddle, cinder-riddle.

**Ringe**—a row of plants, a ridge.

**Ringle**—the rings of iron wire used to "*ringle*" the snouts of swine with.

**Rocket**—a row of holes made by dibbles, the whole length of the *stetch*.

**Roke**—a fog; *roky*, foggy. A sea-roke is a cold fog, a mist, which sometimes rapidly spreads itself over the vicinity of the eastern coasts, and sometimes extends eight or ten miles inland; an unwelcome visitant, both from the uncomfortable feeling it excites, and the belief that it is hurtful to herbage.

**Ruddle**—a mixture of red ochre and pitch, with which weather-boarding is smeared and protected.

**Runcival** Peas seem to have been long grown. Thus Tusser says—

"Stick plenty of boughs among *runcival* peas,  
To climber thereon and to branch at their ease;  
So doing more tender and greater they wex,  
If peacock and turkey leave jobbing their bex."

**Sag**—to fail or give way from weakness of itself, or overloaded, as the bars of a gate, beams, rafters, &c.

**Sale**—the iron or wooden part of the collar of a cart-horse; the hames.

**Sallow** is grown in moist ground for hurdles, &c.; as in Tusser's time, we make our rake heads and teeth of it.

**Scald**—a patch in a field of barley scorched and withered by the sun, in a hot dry season, and on a light soil.

**Scuppit**—a diminutive of scoop, a kind of hollow shovel to throw out water; also a common shovel.

**Seal**—time, season; hay-seal, wheat-seal, barley-seal, are the respective seasons of mowing the first, or sowing the latter crops.

**Seg**—any animal emasculated when full grown; a bull-seg.

**Shack**—the *shaken* grain remaining on the ground when harvest and gleaning are over; or in woodland districts, the acorns or mast under the trees. Pigs and poultry are then turned into the stubble-fields to *shack*.

**Shack-fork**, a large three-tined fork, used in gathering barley and clover into convenient heaps for the pitchers.

*Sheres*—a general name for all the counties in England, except Norfolk, Suffolk, and Essex, called by us the "three counties." The farmers and labourers of these three counties, especially the two former, are disposed to think disparagingly of the talents, stock, and implements of the neighbouring and distant "*sheres*." "Av a touch o' the *sheers* in him," is a very malevolent character to give to a Suffolk horse.

*Shere-man*—any man who has not the good fortune to be born in one of these three counties. He is a sort of foreigner to us and to our ears, which are acutely sensible of any violation of the beauty of our phraseology and the music of our pronunciation; his speech soon betrays him. "Ay, I knew he must be a *shere* man by his tongue."

*Shoaf*—a sheaf.

*Shock*—shocking in shoves. In Suffolk it is seldom that any other than wheat or beans are shocked, oats are sometimes, barley never, probably because it is so much shorter than in the North. However, it was formerly it seems, for Tusser says—

"The mowing of barley, if barley do stand,  
Is cheapest and best for to rid out of hand;  
Some mow it, and rake it, and set it in cocks;  
Some mow it, and bind it, and set it in shocks."

From this it appears that barley was then reaped, when it did not *stand*, or was laid.

*Shod, Shud*—a shed.

*Shorts*—bran mixed with a small proportion of the flour, and therefore more nutritive for fattening pigs, &c., to which it may be given. *Sharps* is the bran ground a second time, which makes it finer, but of course not more nutritive.

*Shot or Shote*—a young half-grown swine. This is now an Americanism.

*Shruff*—sticks and rubbish—the hedger's perquisite.

*Shaffell*—a small spade or scuppett used in draining, and in out-hauling or feyng narrow-bottomed ditches. It differs from a spade in not tapering towards the edge, and in having its sides slightly turned up. Tusser spells it *shavell*.

*Shep*—a basket without a lid, with short handles; a bushel-*shep*, a bee-*shep*. A common hand-basket is never so called.

*Shuttle*—the large casting-shovel used in barns, generally shod or rimmed at bottom with brass, for moving threshed corn, and particularly for casting it from side to side of a barn the whole length of a dressing-floor, that light grains and dust may fall short and be separated from the heavy marketable grain.

*Slade*—1. a green road; 2. a sled or sledge.

*Slink*—to suffer abortion, as applied to a cow only. The cow *slinks* her calf; the mare *slips* her foal; the ewe *warps* her lamb.

*Slop*—the white hempen smock-frock (or loose outer shirt) worn by labourers, especially horsedriers and shepherds; the shepherd's *slop* is generally white, but others are blue or drab; it comes down to mid leg. The Suffolk smock-frock or short slop, sometimes worn by Suffolk lads, &c., comes but just below the middle, and is occasionally seen of milk-white hempen stuff, and neatly embroidered or stitched over the shoulders, round the wristbands, bosom, neck, &c.; it sits rather close, and is, Major Moor thinks, a very becoming outer garment.

*Soppy*—land in a *soppy* state, when not too much so, is thought to be in a favourable condition for receiving the seed:—

"Sow i' the *sop*; heavy at top."

*Sorrel*—chestnut coloured; the *sorrel* horse is not an uncommon sign for an alehouse.

*Spicket*—a wooden-hooked large peg, not much curved, to hang saddles, harness, &c. on.

*Spile*—a wedge of wood stoutly pointed with iron, used in clay or gravel pits, limestone quarries, &c., to let down large quantities at once.

*Spit*—the depth of a spade in digging. We talk of going two or three spits deep.

*Spong*—a long narrow slip of enclosed land, such as a strong active fellow might clear in a "*spang*" or leap.

*Spring*—young whitethorn quick, perhaps from being planted or laid in at that season.

*Spud*—a tool used in cutting up thistles, a diminutive of spade probably.

*Stetch*—the ploughed portion of land between two furrows, greater or less according to the heavy or light quality of the soil. In strong land we go eight furrows to a stetch, called "eight-furrow work."

*Stag*—a cock turkey killed for the table in his second year, by which time he often weighs 20 lbs. or more.

*Stave*—a step or round of a ladder; although this meaning seems common everywhere, it is not in Todd's Johnson.

*Store Pigs* are those kept for fattening or breeding. We believe that the pig which sucks the fore-dill is the best; and the last born "*barrow*" pig or pitman is the weakest, and sucks behind. Tusser also said the same:—

"Sow ready to fare, craves huswife's care;  
Leave sow but five. The better to thrive  
Wean such for *store* as suck before."

*Stour*—stiff, stout; applied in Suffolk to land which works stiff, and to anything of strong vegetable growth.

*Stover*—hay made of clover, sainfoin, and artificial grasses.

*Strike*—a slip of wood, either round or flat, used when measuring corn, &c.; knowing meters receive with a round strike and issue with a flat one.

*Strip*—to strip a cow is to milk her very clean, so as to leave no milk in the dug. In the dairy districts of Suffolk the greatest importance is attached to stripping the cows, as neglect of this infallibly produces disease or diminution of milk.

*Strippings*—the last milk drawn from a cow in milking, considered richer than the first milk. In Norfolk called *strokings*.

*Suchling*—white or Dutch clover.

*Summerland* or *Summerlay*—fallow land ploughed and laying through the summer, or, if suited to the plant, till turnip-sowing time, uncropped. "Making of *summerlands*" is one of the heaviest operations of farming.

*Suss, Suss*—the invitation to swine to come and eat their wash; to *suss* is to swill like a hog. In driving, &c. this obstinate race of animals, we have no other word than *hooe, hooe*, in a deep nasal, guttural tone, appropriately compounded of groan and grunt.

*Swath*-raking—the operation of hand-raking between the *swaths* of mown barley or oats, to collect on to such swaths the loose stalks or ears scattered in the mowing.

*Swipe, Swake, Swike*—the handle of a pump.

*Tathe*—manure dropped upon the land by the cattle and sheep depastured upon it; to *tathe* is to manure land with fresh dung by turning cattle upon it; generally applied to the fold-manure of sheep.

*Teev* or *Tiver*—red ochre for marking sheep.

*Throat-latch*—the narrow thong of the bridle which passes under the horse's throat.

*Thrower*—a kind of knife used for cleaving lath and hurdle stuff.

*Tod*—the head of a pollard-tree; hurdle *tods*, the upright stakes of wattled hurdles.

*Tommy*—a small spade to excavate the narrow bottom of under-drains. The *tom* or *tommy* plough is a plough with a double breast for ridging, or for clearing out furrows.

*Top-latch*—the thong by which the sales of the horse-collar are tied together.

*Toppings*—the second skimming of milk, the first being properly called cream. The butter made from this is called *topping* butter, and is inferior and sold at a less price.

*Traverse*—the smith's shoeing-shed.

*Trip*—a small cheese made in summer to be eaten in its soft and curdy state, as it soon becomes dry, tough, and uneatable. It differs from cream-cheeses as having no cream in, and being thicker.

*Trolly*—a market-cart.

*Tussock* or *Hassock*—a thick tuft of coarse grass in pastures, or of rank growth in corn. *Hassock* has given names to the cushion for kneeling on in churches, and *tussock* to the celebrated tussac grass.

*Tye*—an extensive common pasture. There are several *tyes* a few miles south of the central part of Suffolk.

*Uncallow*—to remove the upper stratum of earth, in order to come to the bed of gravel, chalk, or other substance below it.

*Under-butter*—the same as topping-butter. Though good for present consumption, it keeps but a short time, and is therefore never put up into firkins, but sold for prompt use.

*Up-land*—higher and drier ground, as contradistinguished from fen land.

*Walk*—an unenclosed corn-field. A large extent of country so circumstanced is called the "walks." The name is, no doubt, from the ancient manorial right of sheep-walk over such during a considerable part of the year.

*Wallis*—the withers of a horse.

*Wan*—a long rod to weave into a wattled hedge.

*Waterslain*, or poisoned with water—land requiring drainage.

*Water-ranny*—the short-tailed field-mouse.

*Wenel*—a weaned calf.

*Wenel* is also mentioned by Tusser:—

"Give cattle their fodder in plot dry and warm,  
And count them for mixing and other like harm;  
Young colts with thy '*wennels*' together go serve,  
Lest lurch'd by others they happen to starve."

And

"Pinch never thy *wennels* of water and meat."



*Wisp*—Tusser says,

“ With straw *wisp* and pea bolt, with fern and with brake,  
For saving of fuel some brew and do bake;”

and some use bean-stalks at present.

*Wong*—an unenclosed division or district of some unenclosed parishes; it gives also name to parishes, as Wangford, &c.

*Woodcock-soil*—strong clayey land retentive of moisture, such as woodcocks love.

*Woodlands*—the name given to a considerable portion of that part of Suffolk lying to the north of the turnpike-road to Yarmouth. The soil is strong and deep, and favourable to the growth of timber, and fifty or sixty years back these parts (also called *High Suffolk*) were very finely timbered; but high prices and greater facilities of transport have nearly denuded them. The term *woodlands* is not so much used or known in *High Suffolk* as in the *sandlands*, as those living in the *woodlands* call that part of the county bounded by the rivers Orwell and Alde, and the high road, as being mostly of light soil, badly wooded. One does not see why, but the fact is, that the natives of what is generally called *High Suffolk* do not relish the appellation. It is usually said to begin in the next parish. The roads in *High Suffolk*, which are now very good, and easily and commodiously passable by carriages of every kind, were at the time mentioned (sixty years ago) almost impossible to travel on otherwise than on horseback, and especially in winter, what are called *upstarts* and *wheelspurs* being numerous on them. *Upstarts* or *start-ups* are deep impressions of a horse's foot in clayey soils, soon filled with water, which, when another horse treads in the same place, starts upwards and bespatters the rider. *Wheelspurs* are the raised and rough portions between the wheel-ruts and the horse-path.

*Warble, Warblet*—a hard swelling in the hides of cattle, caused by the growth of a larva, from the egg of a fly deposited there.

*Wooh* or *Wooe* tells cart-horses to stop. The expression “ There's no *wo* in him,” or “ He knows no *wo*,” for a good workman, &c., are common; but more common when “ *ho* ” is substituted for “ *wo*.”

*Woosh* or *Wooch-woo*—in Norfolk tells the horses to go to the right, and *ar-r-r* to the left.

*Yangle*—a triangular yoke, composed of three pieces of wood, about 2 feet long, fastened at their intersections about the neck of a sow, so as to have the base of the triangle horizontal and the apex over her head, to prevent her breaking through fences. The animal is then said to be *yangled*. Horses are also *yangled* when untoward. *Side-yangling* is when the fore and hind feet of the same side are connected by a chain and two shackles. *Fore-yangling* is when the two fore-feet are so chained. *Cross-yangling* the fore and hind feet of different sides; the latter is rare from its severity.

*Yard*—the garden belonging to a cottage or small farm-house is very often called the *yard*, perhaps from humility, as unworthy to be called a garden.

*Yardman*—the hind who has the particular care of the farm-yard, and of the cattle fed there.

*Yelk, Yulk*—to knead clay with straw or stubble, to prepare it for daubers work.

*Yelm*—to lay straw in convenient quantities and regular order to be used by the thatcher, chaff-cutter, &c.; a “ *yelm* ” is a portion of straw laid for that purpose, or as much as can be conveniently carried under the arm for any purpose.

*Yowe*—common pronunciation of ewe; sheep pronounced "*ship*." *Ship* was probably also the ancient pronunciation, as Shakspeare, in 'Love's Labour Lost,' act ii., scene 1, plays on the two words *ships* and *sheeps*.

*Terms of Address.*

The term "bor" is one of very familiar address, and applied to both men and boys. It is not, as some have supposed, a coarse pronunciation of boy, which, if we miscalled at all, we should pronounce "by," not "bor." It is, in fact, the Saxon word bor or boor, still used in the word *neighbour*.

We call girls "mauthers," or more shortly "mor." This is not "mother," as some have thought, as our "mauthers" lose their appellation long before they become mothers. It is, in fact, a Saxon word. The noble virgins selected to sing the praise of heroes were then, as Sir H. Spelman informs us, called "scald-moers," i.e. singing mauthers or mors.

Another apparent misuse of terms, which however is not peculiar to Suffolk, is that in speaking of and to respectable labourers we use the term master, while in speaking of the real master we call him mister. To apply the term mister to the man or master to the master's surname would shock all rustic propriety.

Having now given a collection of local words, I think the only subjects of this class peculiar to the county and suitable for an agricultural account, will be "The Popular Sayings respecting the Weather," and a description of the horkey and other harvest customs; and with these two subjects I shall conclude this section of the work.

*Popular Sayings respecting the Weather.*

1. Evening red, and morning grey,  
Are sure signs of a fair day.  
Evening grey, and morning red,  
Send the poor shepherd home wet to his bed.
2. On Candlemas day, if the sun shines clear,  
The shepherd had rather see his wife on the bier.

This is similar to the old monkish rhyme:—

Si sol splendeat, Mariâ purificante,  
Major erit glacies post festum, quàm fuit ante.

The 2nd of February is Candlemas-day, or Purification of the Virgin Mary.

3. So many fogs in March, so many frosts May.
4. If the robin sings in the bush,  
Then the weather will be coarse;  
But if the robin sings on the barn,  
Then the weather will be warm.
5. A mackarel sky forebodes rain.
6. If the cat washes her face over her ear, it is a sign of fine weather.
7. When frogs in the grass appear of a bright yellowish green, the weather will be fine; if they are of a dark dirty brown, there will be rain.
8. A wet Sunday, a wet week; or  
Rain on a Sunday before church (pronounced chuch),  
Rain all the week, little or much.

But these two sayings, and similar ones, as "Rain on a Friday, rain on a Sunday," and "Rain before seven, hold up before eleven," have not, I think, much sense in them.

9. We have an antipathy to a Saturday new and Sunday full moon, why I know not.

"Saturday new, and Sunday full,  
Was never good, nor never 'wool.' "

And 10.

A Saturday moon,

If it comes once in seven years, comes too soon ;

but this saying is sometimes applied to a Friday new moon, as "Friday's moon, come when it will, comes too soon ;" or, "Friday's moon, Once in seven years comes too soon."

11. If the new moon appears with the points of the crescent nearly vertical, it is said "to hang dripping," and to indicate rain. If the convex part of the crescent is downwards, it is said "to lie on its back," and to forebode fine weather.

12. If the new moon "carries the old moon in her lap," the weather will be stormy. This was also an ancient Scottish prognostic :—

"Late, late yestreen, I saw the new moon,  
With the auld moon in her arm."—*Percy's Ballads*.

13. If the rainbow comes at night,  
The rain is gone quite.

14. Rain when the sun shine,  
Rain tomorrow at this time

15. Near bur, far rain.

The bur is the halo round the moon, and the meaning of the adage is, that when it appears near the moon there will be fine weather.

16. Wheat always lays best in wet sheets.

17. When it rains with the wind in the east,  
It rains for twenty-four hours at least.

We also say of this wind—

"Wind in the east,  
Neither good for man nor beast."

18. March dry, Good wheat and rye.

19. May never goes out without a wheat-car.

20. The grass that grows in Janiveer,  
Grows no more all the year.

21. Cut your thistles before St. John,  
You will have two instead of one.

St. John's Day is June 24th.

22. "First comes David, then comes Chad,  
Then comes Winnold as if he were mad."

St. David's Day is the 1st of March, St. Chad's the 2nd, and St. Winnold's the 3rd.

This alludes to the stormy weather which is common at the beginning of March, and is called Winnol-weather, from St. Winwaloe, a British saint. At Wereham, in Norfolk, was a small priory dedicated to this saint, and a very celebrated horse-fair was held there on his anniversary. This fair is now held at Downham-Market, Norfolk, and retains the old name.

23. Noah's ark ; clouds in an arkite form, or like a large boat, turned bottom upwards, appearing when the sky is for the most part clear, and sometimes spread extensively on the heavens. It is believed among us that such a cloud immediately preceded and prefigured the deluge, and we still confidently expect rain on its reappearance.

24. Water-dogs are small clouds, of irregular but roundish form, and of a darker colour, floating below the dense mass of cloudiness in rainy seasons, supposed to indicate the approach of more rain.

25. The weather-head is the secondary rainbow ; so named from its being above the primary bow, and by its occasional appearance heightening and confirming the supposed sign of fine weather.

26. A sudden and local motion of the air, no otherwise perceptible but by its whirling up the dust on a dry road in perfectly calm weather, somewhat in the manner of a water-spout, is reckoned a sign of approaching rain, and called by us "Roger's blast."

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### Harvest Customs.

The harvest practices are similar in Norfolk and Suffolk. I shall describe the horkey, or harvest-supper, as it is when practised to its full extent ; the horkey being often now kept in public-houses or cottages, instead of at the master's, a certain sum of money (say 2s. 6d. to each man) being allowed in place of supper ; and the gathering largess being merely walking round to all their master's tradesmen and to the neighbouring farmers, asking for beer and money.

The evening before wheat-harvest begins the men "wet (whet) the sickle," as it is called—that is, take an allowance of beer. This beer is often drunk at a public-house, and is the amount given by the farmers as earnest when hired for the harvest (generally 1s. a man), and as much more as they like to spend.

A custom exists among harvestmen in some parts of Suffolk called 'ten pounding.' In most reaps there is a set of rules agreed upon amongst the reapers before harvest, by which they are to be governed during its continuance. The object of these rules is usually to prevent or punish loss of time by laziness, drunkenness, &c. ; and to correct swearing, lying, and quarrelling among themselves ; or any other kind of misbehaviour which might slacken the exertions or break the harmony of the reap. One of the modes of punishment directed by these rules is called "ten-pounding," and it is executed in the following manner : upon a breach of any of the rules, a sort of drum-head court-martial is held upon the delinquent, and if he is found guilty, he is instantly seized and thrown down flat on his back ; some of the party keep his head down, and confine his arms, whilst others turn up his legs in the air so as to exhibit his posteriors. The person who is to inflict the punishment then takes a shoe, and with the heel of it (studded as it usually is with hob-nails) gives him the prescribed number of blows upon his breech according to the sentence. The rest of the party sit by, with their hats off, to see that the executioner does his duty, and if he fails in this he undergoes the same punishment. It sometimes happens that, from the prevailing use of highblows, a shoe is not to be found amongst the company. In this case the hardest and heaviest hand of the reap is selected for the instrument of correction, and when it is laid on with hearty good-will it is not inferior to the shoe. The origin of the term "ten-pounding" is not known, but it has nothing to do with the number of blows inflicted.

*Shoeing the Colt.*—Any one who goes through a harvest for the first time has to undergo the operation called "shoeing the colt." The colt is shod with a hammer on the bottom of his shoes, accompanied with a good deal of kicking, and succeeded by a certain quantity of ale being drunk at the colt's expense. This phrase is not confined to harvestmen, but is extended to any person in a



still keeping hold. The person in the centre blows on the horn one continued blast as long as the "halloo largess;" this is done three times, and immediately followed by three successive whoops, and then the "horkey-ale" is freely quaffed. At this time the hallooming largess is generally performed with three times three. This over, they return to the supper-table, and when the potent liquor has been duly honoured, the lord of the harvest, accompanied by his lady, with two plates in his hand, goes to his master's guests, and solicits a largess from each of them. The collection made, they join their party again at the table; the "lord" recounts the success he has met with, a fresh zest is given to hilarity, and dancing begins. A rustic drama is usually acted on these occasions, which greatly increases the merriment; one of the revellers, habited as a female, feigns to be taken with a violent toothache, and the doctor is sent for. He soon appears, mounted on the back of one of the other men (his horse has a milking-stool to bear his hands upon, to keep his back level); the doctor brings with him the tongs, which he uses for the purpose of extracting the tooth; this is a piece of tobacco-pipe, placed in the mouth; a fainting takes place from the violence of the operation, and the bellows are employed as a means of restoring the pretended sufferer.

The "horkey" is usually finished by the ceremony of drinking healths, in a sort of catch or glee, which is as follows:—

First the mistress:

"Now, supper is over, and all things are past,  
Here's our mistress's good health in a full flowing glass;  
She is a good mistress, she provides us good cheer,  
Here's our mistress's good health, boys; come, drink *half* your beer,  
She is a good mistress, she provides us good cheer,  
Here's our mistress's good health, boys; come drink *off* your beer."

After the mistress, the master:—

"Here's health to our master, the lord of the feast,  
God bless his endeavours, and give him increase;  
And send him good crops that we may meet another year,  
Here's our master's good health, boys; come, drink *half* your beer;  
God send him good crops, &c.; come, drink *off* your beer."

During the time the catch is going round the whole party are standing, and, with the exception of the drinker, they join in the chorus. The glass circulates (beginning with the "lord") in regular succession through the company. If the drinker be taken off his guard, and should drink off his beer at the pause in the catch, he is liable to a forfeit; and if one of the chorus misplaces the words *half* and *off*, which not unfrequently happens, he incurs a similar penalty. Where the liquor flows very freely, and there is a family, it is sometimes usual to carry on the catch through the different branches, with variations composed for the purpose, perhaps at the spur of the moment.

On the following day the party (having various coloured ribbons on their hats, and steeple or sugar-loaf formed caps, decked with coloured paper, &c.) go round among the neighbouring farmers to taste their horkey-beer and solicit largess. The money so collected is usually spent at night in the alehouse, where tobacco and ale are consumed by the men, and a tea-table set out for their wives and sweethearts. The writer adds, that in Suffolk, when the last load enters the farm-yard, he who has the loudest and the clearest voice mounts upon a neighbouring shed and shouts—

"We have ploughed, we have sowed,  
We have reaped, we have mowed,  
We have brought home every load;  
Hip, hip, hip, harvest-home."

But I must confess that I never saw or heard of this last practice.

*Songs, Healths, &c., sung at the Horkey or in Harvest-time.*

1. *Sung on taking the Ale out of doors.*

“ In yon green wood there lies an old fox,  
Close by his den, you may catch him or no ;  
Ten thousand to one you catch him or no.  
His beard and his brush is all of one colour,  
[Takes the glass, and drinks it off.  
I am sorry, kind sir, that your glass is no fuller :  
’Tis down the red lane, ’tis down the red lane,  
So merrily hunt the fox down the red lane.”

**Another is—**

“Come, come, Mr. Gunner; pry’thee, Mr. Gunner,  
A little more powder your shot doth require;  
Fire, Gunner, fire, do, do.  
Come, come, my brave boys, this is rarely well done,  
This is the firing of the gun. Fire, Gunner,” &c.

### *Horkey Healths and Ditties.*

*A Variation of the Master's good health.*

“ Here’s a health unto our master, the founder of the feast, I wish with all my heart and soul in heaven he may find rest ; I hope all things may prosper that ever he takes in hand, For we are all his servants and all at his command. Drink, boys, drink, and see that you do not spill ; For if you do you must drink two,—it is your master’s will.”

*Mistress's good health : variation.*

“ Now, harvest is ended, and supper is past,  
Here's our mistress's good health, boys, in a full flowing glass ;  
She is a good woman, she prepared us good cheer,  
Come, all my brave boys, now, and drink off your beer.  
Drink, my boys, till you come unto me,  
The longer we sit, my boys, the merrier we shall be.”

“ Here’s a health to the barley-mow ;  
Here’s a health to the man,  
Who very well can  
Both harrow, and plough, and sow ;  
When it is well sown,  
See it is well mown,  
Both raked and gavell’d clean,  
And a barn to lay it in.  
Here’s a health to the man  
Who very well can  
Both thrash and fan it clean.”

*Harvest Song.*

1.

“ Now, Lammas, come in : our harvest begin,  
We have done our endeavours to get the corn in ;  
We reap and we mow, and we stoutly blow,  
And cut down the corn that did sweetly grow.

2.

The poor old man that can hardly stand,  
Get up in the morning, and do all he can.

Get up, &c., &c.

I hope God will reward such old harvestman.

3.

But the man who is lazy and will not come on,  
He slights his good master and likewise his men;  
We'll pay him his wages, and send him gone,  
For why should we keep such a lazy drone?

4.

Now harvest is over we'll make a great noise,  
Our master he says you are welcome, brave boys;  
We'll broach the old beer, and we'll knock along,  
And now we will sing an old harvest song."

---

*Healts.*

1.

"Behold, and see, his glass is full,  
At which he'll take a hearty pull;  
He takes it out with such long wind,  
That he'll not leave a drop behind."

2.

"Behold, and see what he can do,  
He has not put it in his shoe;  
He has not drank one drop in vain,  
He'll slake his thirst, then drink again."

3.

"Here's a health unto my brother John,  
'Tis more than time than we were gone;  
But drink your fill and stand your ground,  
This health is called the 'Ploughboy's round.'"

---

*To the Duke of Norfolk.*

At the harvest-supper one of the guests is crowned with an inverted pillow, and a jug of ale is presented to him by another of the company kneeling:—

"I am the Duke of Norfolk, just come into Suffolk:  
Say, shall I be attended, or no, no, no?"

"Good duke, be not offended, and you shall be attended,  
You shall be attended, now, now, now."

---

"At Hengrave," says J. Rokewode Gage, Esq., in his 'History of Hengrave,' "one of the harvestmen is crowned with a couple of ram's horns at the harvest-supper, and an appropriate song addressed to him by the others, something similar to that in Shakspeare's 'As You Like It,' act iv. scene 2."

Had space allowed I should have given the poetical description of the "horkey" from our Suffolk poet Bloomfield, and shown from him how—

"Home came the jovial horkey-load,  
Last of the whole year's crop;  
And Grace among the green boughs rode,  
Right plump upon the top."



As it is, the reason of my giving this at so great a length is that there are no other *agricultural* festivals now existing. The farmer no longer, as in Tusser's time, feasts his labourers at different seasons of the year, nor addresses them as he did with—

“ Come, go to the barn, now, my jolly ploughmen,  
Blindfolded, and speedily thresh the fat hen ;  
And if they can kill her, then give her thy men,  
And go ye on fritters and pancakes dine then.”

Hen-threshing, by the way, was a Shrovetide pastime, not at all to be regretted.

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### *Conclusion.*

Having now given at some length accounts under the various heads, it seems necessary to add a few remarks in conclusion.

Although the work has been extended to a much greater length than was at first intended, I find I have unawares omitted some things well worthy of notice—as, for instance, the covered yards of the Rev. J. Y. Cooke, of Semer, near Hadleigh, who has applied them to fattening bullocks, sheep, and swine. This system appears to combine all the good qualities of the boxes and open yards, with none of their defects. I must refer to the ‘Gardener’s Chronicle’ for June, 1848, where a full description is given of them by Mr. R. Baker, Writtle, Essex.

The great and increasing use of the crag phosphates as manure deserves a longer mention than I have yet given it. Professor Henslow, in a letter written in May, 1848, informs me that—“With respect to the phosphatic nodules at Felixstow (not fossils), I would refer you to the forthcoming Report of the British Association for 1847, Geological Section, and to a short notice in the ‘Athenæum’ of 1847. I visited the spot a fortnight ago, in company with Dr. Daubeny, of Oxford, who is preparing some Report on the subject. We saw 1000 tons lying exposed in one field, and 1000 more had been raised in the same field during the past winter—and this was a speculation independent of the many thousand tons which have been raised by Mr. Lawes. The peculiarity of this deposit is, that all these nodules were originally formed in the London clay, and occur in the crag only as *detrital* materials. We heard they were selling at 24*s.* a ton, and were raised for about 8*s.* or 10*s.* a ton. The manufactured phosphate is sold, I believe, for about 7*l.* a ton.”

Mr. Lawes informs me that “the Suffolk coprolites are found in beds varying from a few inches to 2 or 3 feet at Felixstow, Woodbridge, and the adjoining parishes. They are found in the crag at the top of the London clay. At present only the best beds have been worked, as they cost from 30*s.* to 40*s.* per ton. Alone

they are useless ; but when ground into flour and decomposed by means of sulphuric acid, they form a good manure for turnips."

Mr. W. Colchester, of Little Oakley, writes me word in June, 1848—" In reply to your inquiry as to the extent of the coprolitic deposit in the red crag, and its value as an agricultural manure, I send you its chemical composition as determined from analysis by Mr. Richard Phillips :—

|                               |       |
|-------------------------------|-------|
| Phosphate of lime . . . . .   | 56·00 |
| Carbonate of lime . . . . .   | 18·08 |
| Silica . . . . .              | 7·88  |
| Alumina . . . . .             | 6·00  |
| Oxide of iron . . . . .       | 5·38  |
| Carbonaceous matter . . . . . | 0·44  |
| Moisture . . . . .            | 4·00  |
| Loss . . . . .                | 2·22  |

100·00"

The large amount of phosphate of lime is capable of being reduced into superphosphate of lime by sulphuric acid, in the same way as in bones, and then mixed with guano or other artificial manures. Its fertilizing power over some crops is prodigious.

Mr. Lawes, whose successful application of superphosphate has made his manures so celebrated, has taken out a patent for his method of using acid in their decomposition. As to the extent of the deposit, that is a matter of uncertainty ; the deposit always being in patches, and not continuous, as in sedimentary deposits. I should say, from a rough guess, that from 50,000 to 100,000 tons will be all the red crag will produce ; but there are vast deposits of phosphate of lime in England, in Spain, and in all probability in all parts of the world, so that there is no fear of an abundant supply of the raw material. The locality from which the present supply has been procured lies between the river Orwell and Alde. About 3000 or 4000 tons is all that has been used at present, as the large supply of low guano answers the same purpose, and is cheaper to mix with bone.

I would refer the reader for observations on, and analyses of, Suffolk coprolites and fossil bones to Mr. Nesbitt's paper on the 'Sources of Phosphoric Acid,' in the 'Mark-Lane Express,' April 17th, 1848, and to the same paper, April 3rd, 1848, for comparative experiments on turnips, with bones and coprolites, both dissolved in sulphuric acid, by J. G. Cooper, Esq., Westwood Lodge.

*Burrell's Patent Portable Treshing-machine* obtained the prize of a silver medal at the Royal Agricultural Society's meeting at York, where it was exhibited by the patentee, Mr. Charles Bur-

rell, of Thetford. It is thus described in the catalogue :—"New Implement—a Portable Threshing and Dressing-machine; invented by Mr. Walter Palmer, of Southacre; improved and manufactured by the exhibitor. This machine is capable of threshing and dressing corn fit for market in one operation, and can be driven by steam or any other power; it will thresh from 5 to 6 quarters of corn per hour, without injuring either the corn or the straw, and deliver the corn, chaff, straw, and siftings, or short straws, each in separate places, whereby a saving of from eight to ten hands is effected. The length of the drum is 3 feet; the number of revolutions per minute 1000; diameter of the pulley or drum spindle 6 inches, and driven by a strap."

This machine is driven by horses, or by what is better, by a portable 6-horse power steam-engine.

The advantages of this threshing-machine, omitting the great saving of labour already mentioned, are—

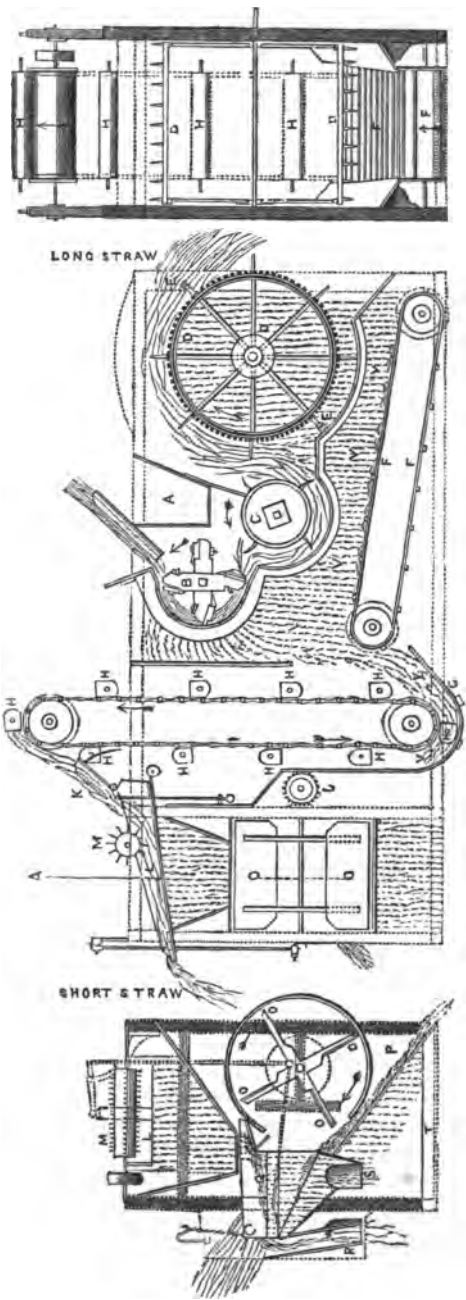
1. The corn is not split, or the straw broken; barley can be threshed by it, without injuring it for malting purposes.

2. It is very portable, and easily moved by one or two horses, as it is on 4 wheels, and the weight only 30 cwt. It can thus, if required, be moved to a stack in the field in fine weather.

3. It is very simple, and not easily put out of order, and all the motions being adjusted by straps, are much more easily adjusted in case of accident than it could be if wheels or gearings were used.

The engravings upon the opposite page show a longitudinal section of the whole machine and cross sections of the shaker and dressing-machine. Duplicate letters allude to the same parts in each view; the arrows mark the direction in which the revolving parts move. A man at A feeds the machine, the beaters are at B, the straw carried onwards by the rakes C and D comes out at E, while the corn falls on the web F and is carried back to G, where an elevator H raises it to a riddle L: the action of a small circular rake M ensures clean sifting. The corn is separated from the chaff by the fanners O: and thus the straw, "colder," short straws, chaff, and corn, are each delivered separately from the machine.

The following comparative statement of horse and steam power was drawn up from experience of the actual working of the machine; but it must be observed, that all the interest on a steam-engine ought not, in fairness, to be laid on the threshing, as it might be used in every farm on a variety of other work, as grinding, chaff-cutting, pumping, sawing, and many other purposes.



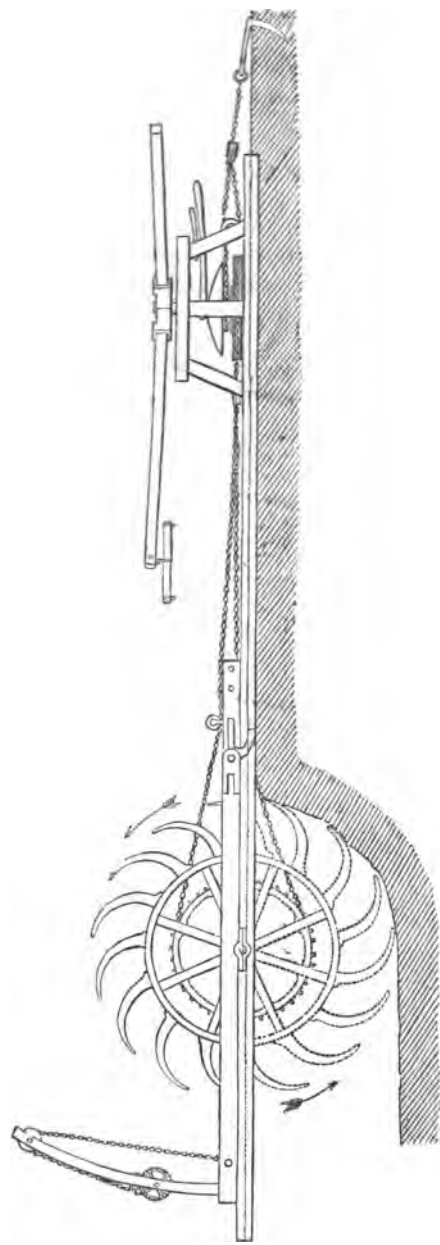
| STEAM POWER.  |     |       | HORSE POWER.  |     |       |
|---|-----|-------|---|-----|-------|
| Purchase of a 6-horse steam-engine (210 <i>l.</i> ), and a threshing and dressing-machine (85 <i>l.</i> ) . . . . . | £.  | s. d. | Purchase of a 6-horse power portable threshing-machine, &c. . . . .                   | £.  | s. d. |
|   | 295 | 0 0   |   | 90  | 0 0   |
| One year's interest, at 10 per cent. . . . .  | 30  | 0 0   | One year's interest on ditto, at 10 per cent. . . . .                                 | 9   | 0 0   |
| 2½ per cent. for repairs . . . .  | 7   | 10 0  | 2½ per cent. for repairs . . . .  | 2   | 5 0   |
| Yearly charge on 5000 coombs Corn . . . }   | £37 | 10 0  | Yearly charge on 5000 coombs Corn . . . }   | £11 | 5 0   |
| <hr/>   |     |       | <hr/>   |     |       |
| An Average Day's Work of Mown Wheat or Barley, 80 coombs.   |     |       | Average Day's Work of Mown Wheat or Barley, 65 coombs.                                |     |       |
|   | £.  | s. d. |   | £.  | s. d. |
| 1 man to drive engine . . . . .   | 0   | 2 6   | 8 horses, at 3 <i>s.</i> per day . . . .  | 1   | 4 0   |
| 1 ditto to feed machine . . . .   | 0   | 2 6   | 1 man to drive horses . . . .   | 0   | 1 8   |
| Young man to untie . . . . .  | 0   | 1 6   | 1 ditto to feed machine . . . .   | 0   | 2 6   |
| 2 men on stack, at 1 <i>s.</i> 8 <i>d.</i> . . .  | 0   | 3 4   | Young man to untie . . . . .  | 0   | 1 6   |
| 1 man and 1 girl to put straw out of the barn . . . . .   | 0   | 2 6   | 2 men on stack . . . . .  | 0   | 3 4   |
| 1 man to pitch straw . . . . .  | 0   | 1 8   | 3 straw-shakers—  |     |       |
| 1 ditto to load . . . . .   | 0   | 1 8   | 2 women at 9 <i>d.</i> . . . .  | 0   | 1 6   |
| A girl to riddle spoutings . . .  | 0   | 0 9   | And 1 man . . . . .   | 0   | 1 8   |
| 1 man to attend to chaff, corn, and colder . . . . .  | 0   | 2 0   | 1 man to pitch straw . . . .  | 0   | 1 8   |
|   | 0   | 18 5  | 1 ditto to load . . . . .   | 0   | 1 8   |
| 8 cwt. of coals . . . . .   | 0   | 6 0   | 2 men to riddle . . . . .   | 0   | 3 4   |
|   | 1   | 4 5   | 1 girl or boy to fill sieves . .  | 0   | 0 9   |
|   |     |       | 1 man to turn dressing-machine  | 0   | 1 8   |
| Interest on capital, and wear and tear of machine, at 1½ <i>d.</i> per coomb* . . . . .                             | 0   | 10 0  | 1 ditto to fill ditto . . . .   | 0   | 1 8   |
| 80 coombs . . . . .   | £1  | 14 5  | 1 girl to potter . . . . .  | 0   | 0 9   |
| 5 <i>d.</i> per coomb.  |     |       | 1 boy to clear away corn . .  | 0   | 0 9   |
|   |     |       |   | 2   | 8 5   |
|   |     |       | Interest on capital, and wear and tear of machine, at ½ <i>d.</i> per coomb . . . . . | 0   | 2 8½  |
|   |     |       | 65 coombs . . . . .   | £2  | 11 1½ |
|   |     |       | Over 9 <i>d.</i> a coomb.   |     |       |

In comparing Suffolk farming of one period with that of another, I omitted to observe that further information, and of a much earlier date, would be obtained by referring to Sir John Cullum's *History of Hawsted*. This volume contains an excellent comparison of the state of the farming, the condition of the labourer, the price of food, and the amount of wages in the county, at different times, and from very early periods. In my 'Essay on Measure Work,' I have quoted several examples of ancient prices of task-work. Perhaps the most remarkable difference between ancient and modern customs is in the manner of conducting harvest-work. Sir John Cullum, taking one year (1388) as an example, shows us that no less than 533 persons

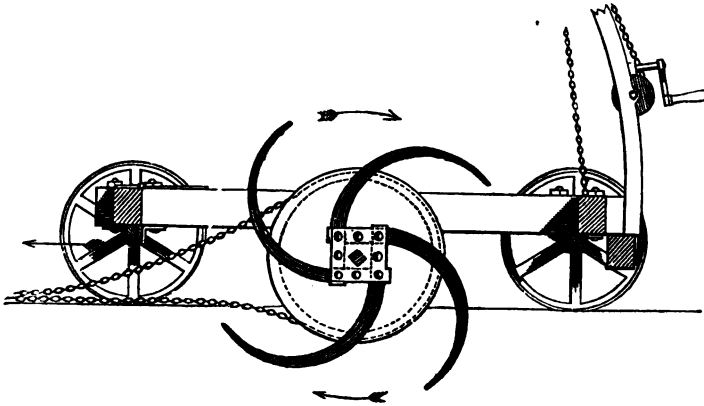
\* A slight allowance is made in consideration of the steam being employed for other purposes than threshing.

were then employed in cutting down, and getting in little more than 200 acres of corn—two large parties being hired every year for *one day* each—these days being probably at some distance from each other, as all the different sorts of corn were hardly ripe at one time.

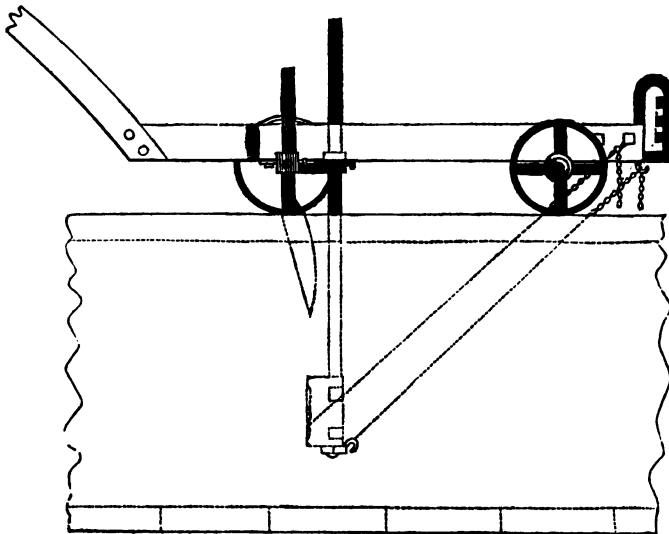
To conclude, I again beg to thank my numerous kind correspondents; and I must say that whatever value may attach to this work is all owing to their assistance. It has been my wish to give all information, with the names, and in the very words of these correspondents. “Honour to whom honour is due!”—It would have been unfair for me to have taken credit for the knowledge so liberally afforded me; and although the course I followed has necessarily occasioned some repetition, yet this defect is more than counterbalanced by the infinitely greater weight such opinions carry, as coming from some of the best, most intelligent, and most experienced agriculturists in the country.



Paul's Draining-Machine. For description, see pp. 307 and 313.



Paul's Revolving Subsoiler. For description, see pp. 207 and 318.



Paul's Plough. For description, see p. 318.



Mr. Paul's Draining-machine, Revolving Subsoiler, and Plough for filling up Drains, are shown in the foregoing engravings.

The draining-machine, which may be also used for raising the subsoil in claying lands, consists of a number of curved scoops fixed on a revolving wheel; it is worked by a windlass and three or more horses, in a manner similar to that of working the mole-plough. It will cut a drain 3 to 5 feet deep at the rate of 4 feet a minute, or raise 4 or 5 cwt. of clay to the surface per minute.

The revolving subsoiler is worked on the same principle and in a similar manner; it will break up the land from 20 to 30 inches deep, and at the same time distribute on the surface any portion of the subsoil required.

The plough for filling up the drains has expanding cutters to undercut the middle or lower portion of the sides of the drain, so as to let down any required portion of the subsoil upon the tiles, while two oblique coulter at the hinder part level in the upper portion of the drain.

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